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GUIDANCE FOR THE HIGH SCHOOL PUPIL

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GUIDANCE FOR THE HIGH SCHOOL PUPIL

A Study of Quebec Secondary Schools

by

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With a Foreword by

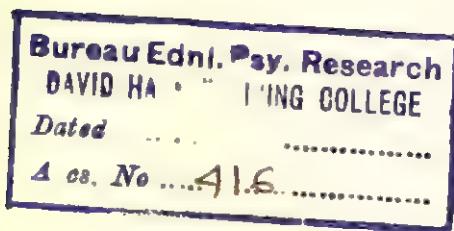
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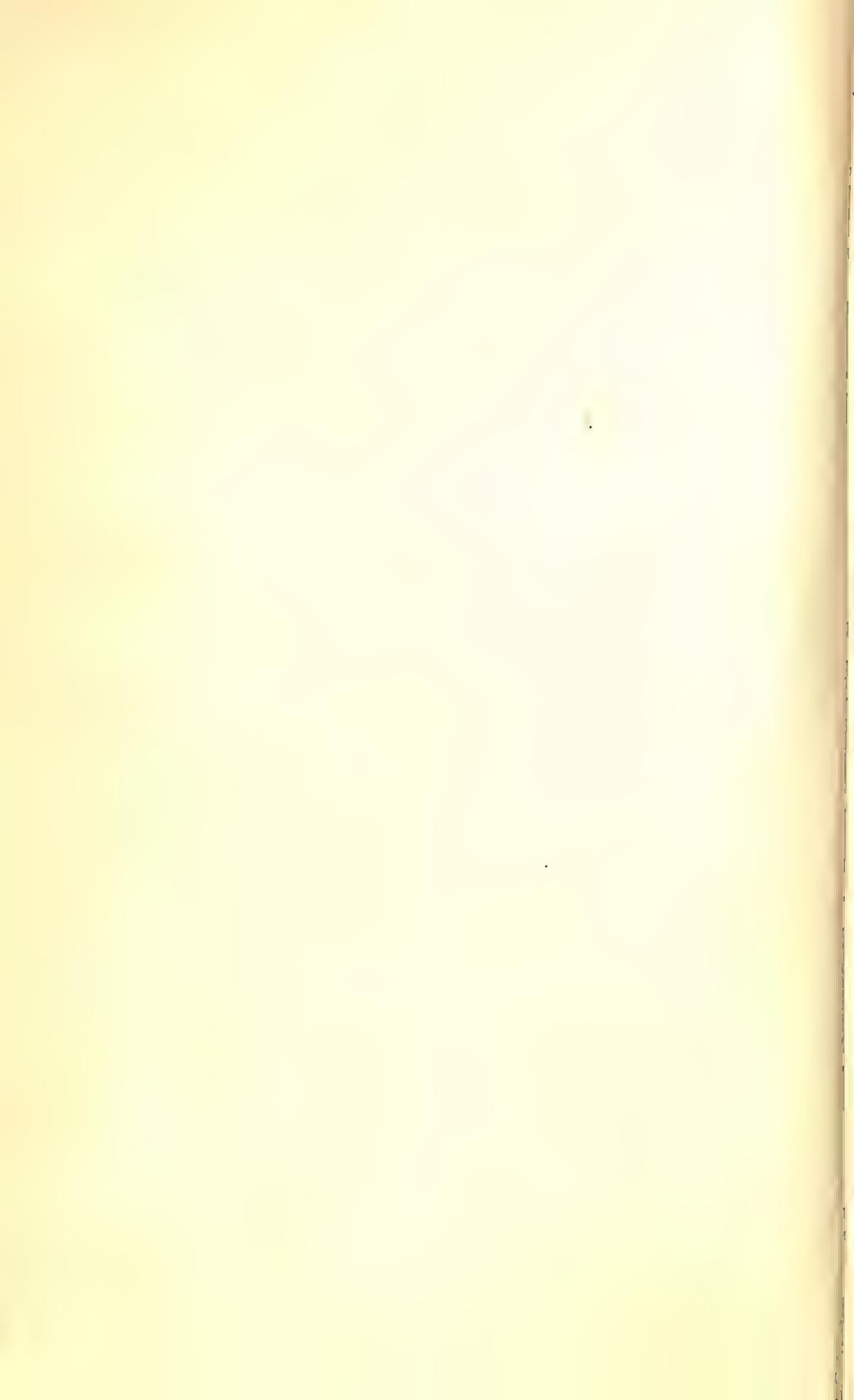
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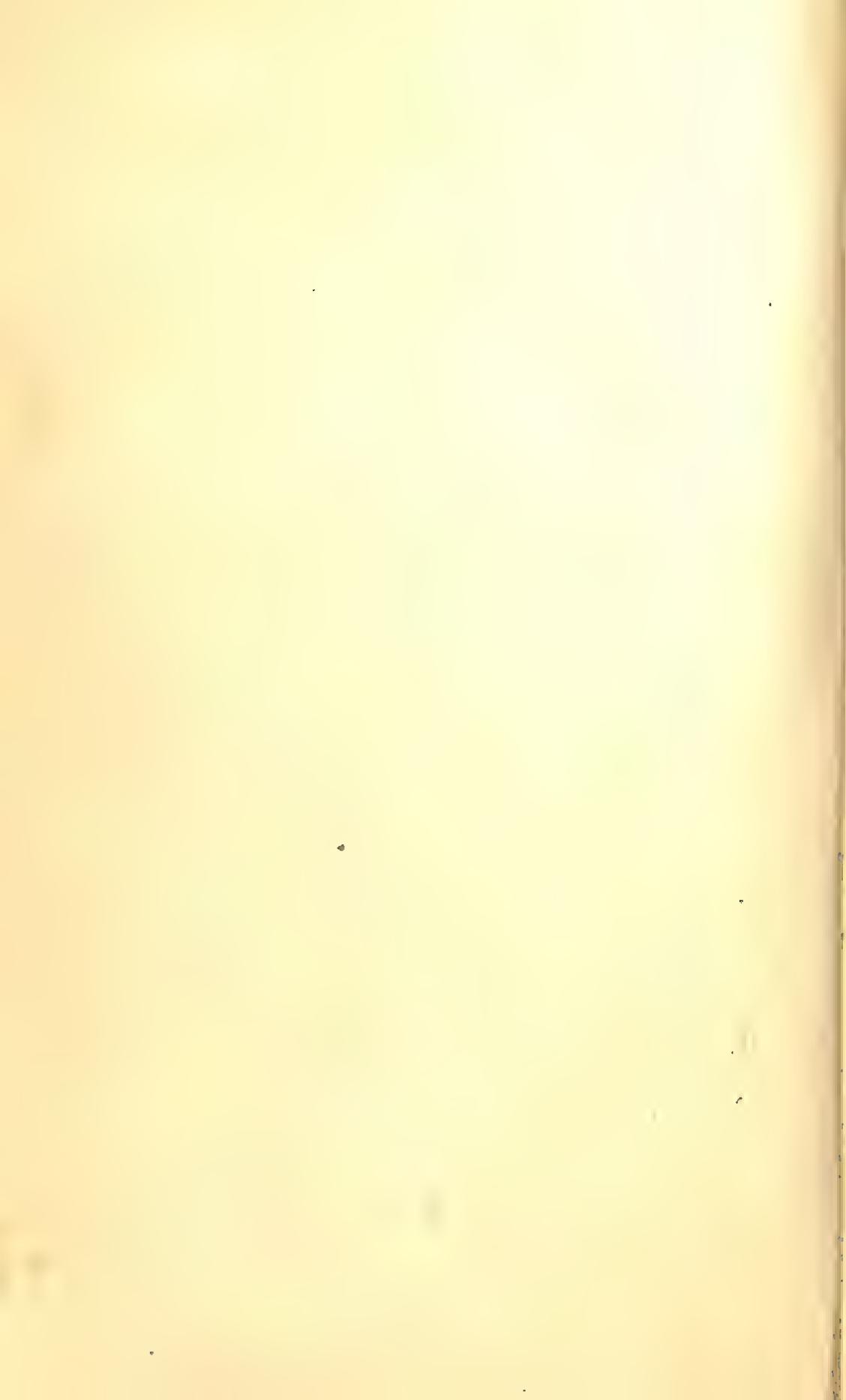
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Foreword

A philosopher of the olden time is credited with the statement that "man is the measure of all things". He is reported to have expanded this by adding that men differ among themselves in their manner of perceiving. This is probably the first enunciation of the fact of individual differences so important in life and in education. Although he has been made the object of all kinds of fulminations by the absolutists, yet modern thought and research have all tended to support his position. Today relativity is not a strange word.

It is a curious commentary on human nature that man himself has been the last part of nature to be measured. The very people who criticized Protagoras, for he is the philosopher referred to above, were the ones who said that the measurement of the human mind was impossible. Yet, it has been done, is being done and will be done. The history of science is largely the history of measurement of the so-called external world where immense advances have been made; but the measurement of human talents, capacities and endowments has been left to the very last. The proponents of the objective world idea are usually blind to the fact that this very world is the creation of the human mind - the result of subjective meditation - and that the laws underlying all our scientific structure are based upon the ways in which the human mind functions - not upon physical ways. Induction, deduction, association, memory, inference, insight, imagination, intelligence and so on are not physical but mental facts. More, the physical facts, so called, are dependent upon them. If a knowledge of the outer world is thus dependent on the mental world, then an adequate knowledge of mental operations is preeminently important.

Modern psychology is the study of these very mental operations as we find them revealed in behaviour, and this behaviour can be measured. This is true of all aspects of mental life but it is especially true and vitally important in the field of Educational Psychology where rapid and significant advances have taken place within the past few years, all due, of course, to more refined methods of measurement. Dr. Webster's study as set forth in this book is an excellent example of this progress and of the value of psychology to the work of the teacher and all those interested in the welfare of our youth.

FOREWORD

Much is heard about the necessity of adapting the curriculum to the child and not the child to the curriculum as of old, but this ideal can only be realized if something is known about the mental endowment of the individual child and how one child differs from another. This knowledge can only be obtained by the use of psychological measurements administered by those who know how to apply them and above all how to interpret them. At the basis, therefore, of adaptive and selective education must lie a thorough knowledge of individual differences - a matter for the professional educationist, not for the layman. Sad to say, some teachers must be included in this latter category due to imperfect training. In a word, intelligent discrimination and selection is the very foundation of all democratic education, and the only one fit to do this is the qualified psychologist for only he possesses the technical skill in mental measurements as they exist today.

This book, then, should serve as partial evidence at least, that the psychologist is a necessary factor in helping to solve many school problems and educational problems connected with the schoolroom and, by the solution of these, affording assistance and guidance to the youth going out to face the perplexities of life as they exist in our day and generation. It should indicate in some measure to the army of amateur educationists that education is a profession and not a field for vague opinions of laymen who pose as educationists and seek to impose their untried theories upon their betters. It should contribute its share towards making education more effective as a force in making democracy more effective. Dr. Webster has faced his task fearlessly and impartially both in the gathering of facts and in the drawing of conclusions. It is a good work well and honestly done.

William D. Tait.

Acknowledgments

The project which this book embodies was initiated by the Department of Psychology as one of its contributions to the co-ordinated series of studies of Canadian problems of employment and related subjects, which have been developed since the University's Social Sciences Research Committee was set up in 1931.¹ The materials of the present volume are the product of five years of research conducted while the author was a graduate student and member of the staff in the Department of Psychology at McGill University. The experimental work which was reported at different stages in the form of Master's and Doctor's theses at the University, has been completely rewritten for the present volume, and related this research to the existing situation of (Protestant) secondary education in Quebec.

Publication gives me an opportunity to express my gratitude to the two men who first interested me in psychology, Dr.W.D.Tait, head of the Department of Psychology and director of the Psychological Laboratory at McGill and Dr.C.E.Kellogg, Associate Professor in the Department. Their helpful advice and encouragement while I was at McGill and afterwards is very much appreciated. My debt to Dr.Tait goes particularly far, as he conceived the present project, devoted much time to its early direction, and has continued to show a keen interest in its progress.

Through the courtesy of Dr.C.S.Myers, Principal of the National Institute of Industrial Psychology, London, England, I had the privilege of spending a summer studying vocational guidance techniques at the National Institute, and this made possible the individual vocational guidance work which is reported in this book. To Dr.Angus Macrae, in charge of vocational guidance at the National Institute at that time, I am particularly indebted for his many kindnesses during my sojourn in London.

In connection with the experimental work, I must thank the Protestant Board of School Commissioners of Montreal and Mr.D.C.Logan, Superintendent of Schools for their co-operation in making it possible for me to give tests to pupils in several schools and for making available records which would not otherwise have been accessible. My thanks are also due to the principals and teachers without whose co-operation progress could not have been made. In order to preserve the anonymity of the schools I do not mention these by name. But I would like them to know that their co-operation, often given at personal inconvenience, is much appreciated.

¹ For a detailed discussion of contributions which psychological studies can make to employment problems, cf. N.W.Morton, Occupational Abilities (McGill Social Research Series, No. 3), Introduction and Chapter 1.

ACKNOWLEDGMENTS

I am very much indebted to Mr. Leonard C. Marsh, Director of Social Research at McGill University, for the time and thought given to the reading and editing of material for this book, for the many constructive suggestions he offered, and for his unfailing support during periods when pressing immediate activities made the date of publication doubtful.

Among the members of the Social Research Office staff I would like to thank particularly Miss G.L. Slack for the labour of typing many manuscripts, and Miss L. Strachan for the detailed collation of the printer's copy.

While I am grateful to the many persons who have assisted me, both in the research upon which the volume is based and in its preparation in the present form, I do not commit them to any contentious conclusions reached or opinions expressed in this book. The responsibility for these I must bear myself.

E.C.W.

Psychological Institute
Montreal,
December 11, 1938.



Part I—INTRODUCTORY



Chapter 1

The Scope and Possibilities of Educational Guidance.

Vocational guidance has been described by the National Vocational Guidance Association as "the process of assisting the individual to choose an occupation, prepare for it, enter upon and progress in it. As preparation for an occupation involves decisions in the choice of studies, choice of curriculum, and the choice of schools and colleges, it becomes evident that vocational guidance cannot be separated from educational guidance".¹ Guidance should commence with the first choice of school subjects and continue until the individual becomes a gainfully employed adult in a congenial occupation. Primarily, guidance is a function of the parents and the school authorities. While parents may lack the knowledge of educational avenues possessed by the good teacher, they are bound to be interested in gaining for their child the training for which he is best adapted. In the school, the satisfactory working of school administration, if no other reason, forces the educational authorities to give direction to the children enrolled in their classes, and assist them to make choices.

Either casually or deliberately, therefore, the child is guided by forces within the home and school in making his choice of curriculum and occupation. His innate intellectual and temperamental tendencies are moulded into the habits, the interests, and the personality of the adult. Where guidance is casual, the desire to enter upon a particular school course, to study certain optional subjects, or to secure a particular job, is not based upon a recognition of innate and environmental potentialities or limitations. Where guidance is deliberate, one of three situations will present itself. The boy or girl may be encouraged to commence a course of activity which is socially satisfying to parents and friends. He may be forced along the lines of least resistance in the school curricula. Or, the child may be assisted to understand his own abilities, habits, and personality; he may be encouraged to compare these with the qualifications necessary for success in various types of school courses and occupations. And he will come gradually to the habit of making an objective appraisal and choice. "Guidance education" of parent as well as child must be directed toward this latter alternative. There is too often a disregard of the large body of data which clearly indicates that individual differences exist in the form of psychological characteristics which are modifiable only to a limited extent. Such attitudes which neglect modern research are commonly found among parents. The child's failure in school is explained by the laziness of the pupil or the poor qualifications of the teacher. The parent demands that his child shall complete, a school course for which the pupil lacks the necessary abilities. The school teacher, on her side, is necessarily concerned primarily with the achievement of the class. She has neither the time, the training, nor the facilities to concern herself with the potentialities of each particular boy or girl. Furthermore, by training if not by disposition, the teacher's viewpoint is biased towards an intellectual curriculum. This leads to an over-evaluation of the academic courses of study.

We cannot escape the conclusion that neither parent nor teacher is completely qualified to direct the pupil. Each has an important rôle to play in the developing of sound attitudes and sane ambitions in the child. But both - at certain stages at least - should be subordinate to a neutral individual without the bias of either. This counsellor's training must be primarily in the field of psychology if

¹ *Principles and Practices of Vocational Guidance*. National Vocational Guidance Association: Bureau of Vocational Guidance, Cambridge, Mass. 1931.

a maximum of service is to be rendered the pupil.

Guidance is both complex and difficult. Merely to express John's or Mary's abilities in numerical terms does not solve the problem. To what extent do these figures represent all of child's abilities? What prognostic values have they? Answers to these and similar questions respecting the habits, interests, emotional development, and personality of the growing adolescent provide only a beginning to the objective knowledge which must be obtained to make personal guidance reliable.¹ A complete solution will be secured only when it is known how John's or Mary's behaviour tendencies compare with those of other pupils. Further, the particular combination of abilities and achievements prerequisite to success in various school courses and occupations must be determined before the success of the novice can be predicted. It is the task of much psychological and educational research to provide answers to these fundamental questions.

Most boys and girls must select one of several optional school courses or else find an opening in the industrial world prior to their fifteenth birthday. This choice will firmly mould their later occupational history. To leave school on completion of the elementary grades - even more, before they are completed - is to ask for routine and possibly intermittent work, probably of semi-skilled or labouring nature. Successful completion of a matriculation course supplemented by the necessary financial stability, on the other hand, makes possible the entrance to the professions, or to higher administrative work. Matriculation does not prepare the youth for office positions such as typist, bookkeeper, or stenographer; (though it is widely accepted as so doing); a commercial course provides this training, but does not give matriculation standing. The boy who desires to enter a skilled trade by a more direct method than working his way up as an apprentice in a craft, must select a technical school course, or else lose valuable years in an academic course of little or no use to him. A general course designed to emphasize the cultural aspects of the matriculation course may be the only additional option available to the youth electing secondary school.² Which shall he enter? Which will be of the greatest benefit to him? The limitations of these choices must be recognized. Large percentages of the working population under 25 years of age are found in farming, housekeeping, retail and wholesale selling, restaurant and hotel work, and others are distributed in smaller numbers over various specialized industrial positions. Which high school course will be of the greatest value to the young man or woman looking to one of these fields?

The fact that no secondary school course provides training in the particular skills required of these groups of workers multiplies the difficulties facing a guidance project. The values and limitations of the various courses of study will be determined only by careful and extensive investigations. An efficient school system should provide courses adapted to the needs of every large group of pupils registered for instruction. Where such curricula exist, pupils of varying levels of ability, differing in habits, personality, and interests, could master the work in one or another of the available options. They would graduate from high school able to look back with pleasure upon their academic career. Interests fostered in secondary school would continue to provide satisfactions in later life. On the other hand, scholars attempting curricula not suited to their needs, fail and repeat grades, study under compulsion, are irked by the discipline of the school room and are, in general, happy to be free from such uninteresting pursuits. These young people cannot be expected to develop leisure-time activities on the basis of their previous education. Their adult leisure-time activities - to say nothing of their occupational destinations - are more likely in these circumstances to develop in direct antipathy

¹ Unfortunately, there is evidence that many high school teachers have little interest in pupils not preparing for matriculation.

² Other courses free from the domination of matriculation would also be welcome.

to the school environment. Adequate solutions to the problems confronting educational guidance can only be provided by the closest co-operation between the educationist and the psychologist, and with the support of the parents. The psychologist must evaluate the educational system in terms of the individual, and the educationist modify it in terms of the group, till it gives maximum benefit to the largest possible number of individuals.

The benefits of well-planned curricula options with guidance forming an integral part, extend beyond the individual scholar to the larger community. Employers gain through obtaining workers with the self-confidence which comes from a successful school career. Employees who must adapt themselves to routine positions build up avocational interests to provide an adequate outlet for surplus energy and ambition. The community at large is far from having accepted this emphasis as yet, although the educational and welfare policies of some large industries indicate that their managements are cognizant of the potential therapeutic values of leisure-time employee activity. But the success of this depends on the employee as well as the management, and hence, behind this, on educational guidance and efficiency.

Nature of the Present Study.

The present investigation was undertaken as one of a number of research projects in the field of employment problems. The purpose of the study was two-fold. It was, first, to investigate the possibilities of organizing vocational and educational guidance at the earliest high school ages in Protestant schools of the City of Montreal. And, secondly, it was to investigate the relationship between measures of psychological abilities and (a) formal school training, (b) the choice of optional school subjects, (c) the chances of an individual's success in various occupations, and (d) the choice of occupation by new entrants to the labour market.

The first differentiation of curricula in the Montreal Protestant schools is at the commencement of secondary school. (Grade VIII). What degree of guidance can be given satisfactorily at this point in a youth's school career? The technique adopted to throw further light on this question was to administer psychological tests of ability, interests, etc., and correlate the results obtained with the previous and subsequent record of the student.

The first purpose of the investigation is dependent upon the second. The practicability of guidance within the secondary school will be determined by knowledge concerning: (1) certain relationships between psychological abilities; (2) the distribution of these abilities among the pupils following different courses of study, and (3) the actual value of psychological tests in the prognosis of achievement. This knowledge can be secured in one way. Pupils must be segregated on the basis of occupation chosen; then their progress followed in their subsequent careers.

The general plan adopted was first to administer psychological tests to groups of boys in the first year of secondary school (Grade VIII). Their progress as denoted by grade promotions and school marks was followed for one or more years, and the relationship between this progress and test scores was determined, taking both the distribution and the magnitude of these scores into account. Unfortunately, few boys left school and found work in the years subsequent to the commencement of the study; consequently the investigation became re-

¹A follow-up was made of 48 boys who had been given psychological tests in 1931 and who had left high school prior to February 1st, 1935. Eighteen were found to be attending other educational institutions, fifteen were working and fifteen had secured no employment. Five boys had left school to take jobs offered to them, twenty-two had left for financial reasons, and three owing to illness. The average time the boys had been out of school was 1 year and 7 months.

secondary school were given various tests (including the ordinary elementary school leaving examinations) and their progress followed for one or more years. The method of these studies was originated by Kelley. School marks, standardized test scores, or ratings of traits expected to bear upon academic success, have been compared with actual standing one or more years later. School marks and psychological tests of intelligence were both found to be of value in the prediction of later school success. While some conflict appeared between the results of Kelley and Fretwell, both these investigations were made prior to the development of standardized group tests of intelligence. Kelley determined that school marks had greater predictive value than specially constructed achievement tests, while Fretwell reported that a group of psychological tests possessed greater predictive value than elementary school marks. Ross' investigation is of special significance. He obtained a regression equation by means of which school marks could be predicted in New Rochelle, N.Y., and then applied this equation to data obtained in Des Moines, Iowa. The predicted marks were not sufficiently close to those actually obtained to warrant the application of the regression equation in the prognosis of an individual's school achievement. Ross concluded that intelligence tests provide better data from which to predict marks; these were followed by standardized achievement-tests and teachers' ratings.

Ross also compared pupils who completed high school with those who did not. The former were younger, they went through the grades more rapidly, and had better elementary school records in spelling, reading, arithmetic, geography, history, English, fine arts, and in effort.

L.H. King used a combination of mental tests and interest tests to predict marks in English to an extent that was statistically significant, but the agreement between predicted and actual marks was not sufficiently close to warrant the use of his regression equation in individual cases. From a consideration of earlier studies, however, King concluded that age presents very slight possibilities as a prognostic factor.

Mention must be made of Thorndike's study of educational prognosis in his investigation of the use of psychological measures in vocational guidance.¹ He concluded, that the age and grade status of a pupil at a given time offers the best single measure of future educational success. Psychological test scores appear to add but little to the predictive value of the age-grade status. Thorndike's work constitutes one of the most elaborate investigations of the relationship between psychological and educational measurements and secondary school progress; but unfortunately no reliance can be placed upon conclusions in respect to educational prognosis. An elaborate statistical structure is imposed upon very unreliable data. Thus, for example, the relationship is computed between as many as five items and future educational success, when the latter measure was in many instances² the predicted success that would have been obtained had the pupil continued in school.

In England, Amos, Collier, and Valentine³ have compared the effi-

¹ Thorndike, E.L. "Prediction of Vocational Success". The Commonwealth Fund, New York, 1934.

² Data presented in the book do not indicate the exact extent.

³ (a) Amos, A. D. "Examinations and Intelligence Test Forecasts of School Achievement". *British Journal of Education Psychology*, Vol. 1, 1931, pp. 73-86.

(b) Collier, J.W. "Predictive Value of Intelligence Tests for Secondary Schools." *British Journal of Education Psychology*, Vol. III, 1935 pp. 65-70.

(c) Valentine, C. W. *The Reliability of Examinations: An Enquiry*. University of London Press, London, 1932.

cacy of intelligence tests and the regular examinations in predicting secondary school success. All three conclude that the best prediction of secondary school achievement is obtained by pooling intelligence test scores and entrance examination results.¹

The verdicts arrived at in investigations of the relationship between educational and psychological tests and progress in the secondary school all tend to agree in showing that elementary school success offers a definite forecast for achievement in the higher grades. The addition of psychological tests, particularly of intelligence, improves the predictive value of elementary school marks. Ross, the only investigator to use standardized educational tests, has recommended that they be given greater consideration than school examinations.

These investigations do not indicate by themselves the extent to which educational and vocational guidance by psychological tests is justified in Montreal. The educational structure in Montreal has a number of special features, and the problems facing the boy or girl entering high school differ in detail from those in other centres. This aspect of the present investigation is examined in the chapter which follows, before proceeding to its results.

¹In common with the American ones English studies (with the exception of Ross' investigation) deal exclusively with pupils in school. Little or no attention was given to the academic record of those who left secondary school during the course of the investigation.

stricted mainly to an examination of the choice of school courses and comparative school progress.

Apart altogether from the question of "finding a job", the problems here raised are of immediate importance to the individual child, the educationist, and the parent. It is of vital interest to the pupil to know whether he stands a greater chance of passing if he follows one rather than another course of study. This is true whether or not he has any thought of the occupations he may enter upon completion of these courses. For he will "like best" that course which is best adapted to his own interests and mental standards. Certain further questions must be answered. Are there differences in the psychological characteristics of students who enter each course? If there are, do these tend to increase or diminish as the pupils progress through the high school grades? The answers to these questions matter very greatly to the educationist responsible for modifications of the existing school curricula. They are of value also because the employer rates all applicants to some extent on the basis of formal education. If psychological differences exist between pupils graduating from two courses, school leaving may have greater significance in one case than in the other. Graduation from one course may be indicative of superior intellectual abilities, while graduation from another course may indicate that the student is probably of average or inferior general intelligence. Graduation from a third course may point to probable special abilities.

It is important to know if school marks vary in a manner consistent with psychological test scores. There are of course limitations to psychological tests. Some may not differentiate pupils according to the school course chosen. Some may not differentiate graduating students from those who did not complete the courses. School marks are available to school authorities at all times. Presumably they play an important rôle in whatever advice is given by teachers and principals. Do they justify this importance? To what extent should they be supplemented by other measures? The parent who attempts to assist his child in making a reasonable choice of curricula must know the answers to these same questions. The school report is his sole objective method of judging the educational potentiality of his child. Consequently he should be able to evaluate this report in an intelligent manner.

Present Evidence on the Subject.

This book is particularly concerned with the answers to these questions as they have been raised in Montreal. But the trend of thought and investigations on the subject elsewhere, when allowances are made for differences of technique, are obviously relevant. What aid can be gained from the results of these related studies?

Prior to the commencement of the present project, a large number of investigations had been reported which concerned one aspect or another of vocational and educational guidance. Additional reports have been published since. Those published up to 1930 have been summarized elsewhere,¹ and only representative and pertinent samples need be considered. They may be divided according as they deal with (1) the distribution of abilities and skills in different educational groups or (2) the relationship between psychological and educational measurement and secondary school success. The latter classification may be further divided according to the applicability of the conclusions to the English or American school systems. This sub-division is particularly important in reference to school marks, as entrance to the English secondary schools is based mainly upon results of an English and

¹ See St. John, C.W. *Educational Achievement in Relation to Intelligence*. Harvard Studies in Education, No. 15, Harvard University Press, Cambridge, Mass., 1930. A summary is presented here of much of the work on the general problem of the relationship between psychological and educational tests. Further references are given in the bibliography.

an arithmetic examination, whereas promotion in American and Canadian schools is made on the basis of marks obtained in a wider range of subjects.

A number of broad surveys made in American schools have indicated that different school courses appeal to pupils of different levels of general ability as measured by tests of intelligence.¹ The specific application of these studies, of course, is likely to be limited to the school system in which the investigation was conducted. Differences in the number of courses and the subject-matter of each curriculum, in addition to more general social forces, naturally affect the attractiveness of a particular school course. However, the general type of conclusion drawn from these studies is important, and two examples are worthy of citation.

In 1922 Ruth Clark² analyzed the results obtained from an intelligence test which had been administered, at entrance and graduation, to students in high school courses in New York City. She found that a pupil of below-average intelligence had only one chance in one hundred and fifty of graduating from an Academic course. The same student had three times as many chances of graduating from a Technical course and five times as many chances of graduating from a Commercial course.

In the same year W.F. Book³ published the results of an analysis of the intelligence test scores obtained by senior high school students throughout Indiana. In considering the intelligence of seniors pursuing different courses of study, he states in part "...the largest percentage of students with superior and very superior intelligence took the classical, academic, and scientific courses. The college preparatory, commercial, and vocational courses contain the smallest percentage of seniors belonging to these superior groups. The general course contains the largest percentage of seniors rated D, E, or F (all below average intelligence) with the commercial and vocational courses coming next".⁴

These two studies are typical of a number summarized by Pintner. That is, wherever a cross-section is made of pupils attending various courses of study, and all are given psychological tests of intelligence, it is found that the more intelligent tend to be concentrated in certain courses rather than others. The significance of this fact has not been fully recognized by investigators who have been concerned with evaluating the efficiency of devices used for the prognosis of school success.

Experimental studies of the prognosis of secondary school success in the United States have been largely restricted to workers from Teachers College, Columbia University. The research of Kelley, Fretwell, Ross, and King⁵ consisted of follow-up studies in which pupils entering

¹See Pintner, R. *Intelligence Testing*. New Edition, Henry Holt, New York, 1931. Chapter XI summarizes a number of these studies.

²Clark, Ruth S. "A Glimpse at High School Courses as Measured by the Otis Test". *Journal of Applied Psychology*, Vol. VI 1922, pp. 184-191.

³Book, W.F. *The Intelligence of High School Seniors*. Macmillan, New York, 1922.

⁴Ibid. pp. 146-148.

⁵(a) Kelley, T.L. "Educational Guidance" Teachers College, Columbia University, *Contributions to Education*, No. 71 (1914).

(b) Fretwell, E.K. "A Study in Educational Prognosis" Teachers College, Columbia University, *Contributions to Education*, No. 99 (1919).

(c) Ross, C.C. "The Relation between Grade School Record and High School Achievement: A Study of the Diagnostic Value of Individual Record Cards". Teachers College, Columbia University, *Contributions to Education*, No. 166 (1925).

(d) King, L.H. "Mental and Interest Tests: Their Evaluation and Comparative Effectiveness as Factors of Prognosis in Secondary Education". Teachers College, Columbia University, Bureau of Publications, N.Y. 1931.

Chapter 2

The Nature of the Study.

An investigation of the factors affecting school progress is "conditioned" by three things: (1) the social structure with which it deals; (2) the extent to which the individuals studied are representative of all the people affected by this social structure; and (3) the techniques used to analyze the problem. In the present study, the educational system in Montreal is the chief part of the social structure with which we are concerned. Secondly, all pupils who attend school could not be examined. A sample had to be selected which would as far as possible be typical of the whole. Finally, the techniques which were developed to investigate the problem are in part those used in other studies and in part were evolved in the course of the investigation. These three limiting factors will be described in this chapter.

The Montreal School System

In the Province of Quebec,¹ there is a Superintendent of Education but no Minister of Education. The Provincial Secretary, who also controls technical and industrial education, represents this Department in the Cabinet. An English and a French secretary support him as deputy ministers. The former is the statutory Director of Protestant Education.

Two executive committees are co-ordinated in a Council of Education. One is Roman Catholic, the other Protestant. The Protestant Committee of the Council of Education consists of a number of members appointed by the Lieutenant-Governor-in-Council together with seven associate members, one of whom is a representative of the Provincial Association of Protestant Teachers of Quebec. These committees sit separately. Their independent powers are so complete that joint meetings are rare and occur only when school questions arise which affect the interests of both Roman Catholics and Protestants.

Each committee independently regulates the organization, administration, and discipline of their respective schools, the duties of school inspectors, and of the Central Board of Examiners. Each has the responsibility of authorizing text books for use in schools of that faith, and no deviations from this authorized list may be made without the consent of the committee concerned.

Education is governed in each municipality by a Board of School Commissioners.² In certain of the larger centres, including Montreal, Westmount, Quebec, and Sherbrooke, independent Boards of commissioners are selected for both Protestants and Roman Catholics.

By virtue of this organization the Protestants and Roman Catholics are able to conduct their own schools, and operate independently of one another. In the present study this arrangement permitted the restriction of the enquiry to Protestant education. As will be noted later, this denomination is not necessarily synonymous with a single racial or language group.

¹ At the time of going to press a Committee is examining comprehensively the structure of Protestant education. No major changes prior to this have been instituted in the last decade.

² There may be more than one in a given area, because, by a process known as "dissent", any group of ratepayers or holders of the religious belief different from that of the majority may give notice of their intention to withdraw from the control of the majority Board and form a minority one.

Curricula in the Schools

The course of study in the Protestant schools is usually completed in eleven years or grades. For present administrative purposes these are grouped into three divisions; namely, Elementary, Intermediate, and High Schools, the two latter being considered as secondary schools. The first seven grades are taught in the elementary school, two additional years are provided in the intermediate schools, while all eleven grades are found in the high schools. Within the elementary schools there is no differentiation of curriculum, but in the secondary schools there are two optional courses, one General and the other Academic. The latter, which is designed as preparatory to university matriculation in the Faculty of Arts, contains more compulsory subjects than the former, but the two are of equal difficulty. On fulfilment of the necessary requirements graduates of both courses are granted High School Leaving Certificates.

In the present study, the first year of secondary school - Grade VIII - was singled out for emphasis and individuals selected from this grade. The pupils examined were registered in both the General and the Academic courses of study. The character of these courses and their differences can be seen from the details below.²

Grade VIII Curriculum, Quebec (Protestant Schools)

(a) General Course		(b) Academic Course	
Subjects	Marks Obtainable	Subjects	Marks Obtainable
<u>Compulsory</u>		<u>Compulsory</u>	
1. Arithmetic	200	1. Arithmetic	200
2. English Literature and Composition	200	2. English Literature and Composition	200
Spelling and Dictation	100	Spelling and Dictation	100
Language	100	Language	100
3. French	200	3. French	200
4. History	100	4. History	100
<u>Optional</u>		<u>Optional</u>	
* Art		One other subject from the optional list in the General course	100
* Bookkeeping			
Geography			
General Science			
* Household Science			
* Manual Training			
* Music			
* Stenography and Typewriting			

¹ In addition to the compulsory subjects, from one to three options must be selected to complete the grade. The subjects marked with an asterisk are available only in schools that have adequate equipment and appropriately trained teachers. A small deviation from the schedule above is that in Montreal, algebra is taught to Grade VIII pupils following either course.

² The subjects outlined above form the basis for all optional high school curricula in the Province. Montreal's six high schools do not

¹ Certain differences exist in the organization of rural and urban elementary schools, which are not considered here as the investigation is concerned solely with city schools. Neither is consideration given to the curriculum of special classes for mentally retarded children.

² "Memoranda for the Guidance of Teachers in the Protestant Schools of the Province of Quebec". Department of Education, Quebec, 1934.

each give courses identical with either the Academic or the General. Subjects are rearranged in various ways and certain ones are not taught in all schools. Emphasis can be placed in any particular school upon one of two types of course, namely, preparation for university or preparation for a commercial career. The academic course offers a choice between Arts and Science subjects only after two years, and Latin is compulsory at the outset. The Commercial course proper adds typing, shorthand and bookkeeping to the other principal subjects from the General Course. Like the Academic Course, it requires four years to complete.¹

McGill University requires students proposing to enter a B.A. course to have studied Latin in high school; but those entering a B.Sc. or B.Com. course need not have done this if they have taken additional science and mathematic subjects. This permits variations in the matriculation course of study. A choice of two alternatives can be made on entering Grade X in every high school which (presumably) prepares boys and girls for university: Latin is studied in one; additional mathematics and science courses in the other. Pupils then remain in the one course or the other through the tenth and eleventh grades. These two courses may be differentiated for purposes of clarity by using the expression "Latin course" (or Arts course) and "Science course" in reference to them.

Why study Latin for two years if one wants a science matriculation? This question has been often asked, and the present answer runs as follows. Some schools do not require and study of Latin from students seeking the science matriculation. General Science is accepted as a substitute for Latin in Grades VIII and IX. In schools where this procedure has been adopted, pupils determine, on entering Grade VIII, whether they want to prepare for the B.A. or the B.Sc. matriculation examinations. Those who studied Latin are still able to change to the Science course when they enter Grade X; but if they took the option of General Science they cannot transfer to the Latin course at the Grade X level. Not all schools provide this alternative at the commencement of Grade VIII, and in these the courses are identical during Grades VIII and IX.

Why should the pupil who does not wish to enter university or an office take either a matriculation or a commercial curriculum? Why should he not take a broad cultural course? This question also has been raised. It is answered so far, through the introduction into certain high schools of a "general course" which leads to neither of the alternatives mentioned. Pupils who take it secure a High School Leaving Certificate on completion of four years study. The subjects they study are the same as those studied by matriculation students except that they take neither Latin nor advanced mathematics. This course was first introduced in the Montreal schools in 1932, but few pupils have chosen to follow it, because the possibility of "getting to college" has always persisted in parents' minds, and sometimes because the School Leaving Certificate is regarded as implying inferiority. After two years, the Board of School Commissioners pronounced the situation as follows:

"Classes in what is known as a General Course were organized some years ago when a modified curriculum was authorized by the Department of Education, but the great majority of parents demand the full course (matriculation) for their boys and girls with the university as their objective, and in consequence the number of pupils who are struggling with an impossible problem has become increasingly great.....the only

¹ Reference to Montreal schools in the present text means only those in the control of the Protestant Board of School Commissioners for the City of Montreal. No schools in Greater Montreal were covered in the samples.

way open to us of coping with the situation is that of compelling a larger number of pupils to follow the General Course".¹

The remedy is to change Matriculation requirements, to raise the prestige of the School Leaving Certificate, to educate prospective employers on its value, or some combination of all of these. But this is a wider question than can be covered in the present book.

Guidance at the Turning-Point.

Taking the alternatives as they stand at present, the pupil has to choose among four curricula when he enters high school. Two, differing in that one includes Latin instead of science and mathematics subjects, lead to matriculation; one to commercial and clerical vocations (stenographers, bookkeepers, salesmen, accountants, etc.,) and the fourth, directly at least, to neither of these goals.

Grade VIII is thus a vital turning-point. Can intelligent guidance be given these pupils who are from twelve to fourteen years of age? The decision made by or for the boy will affect his adult life in many ways. It is imperative that the choice be as informed as possible. In the case of the students investigated, the choices had been made. Yet nothing was known of the factors which led one pupil to take Latin, another Science, while a third commenced the Commercial Course. It was known that few students were willing to enter the General Course. What are the differences in pupils who enter each? The answer requires much careful measurement.

This study answers a number of these questions. It attempts to show the value of guidance at the commencement of high school, and relates to samples of pupils in each of the four courses. The critical test of a pupil's judgment in selecting courses of study comes when he enters Grade VIII. Whatever he studies in high school or college will depend in part on this choice made when he left elementary school. This is the clear reason for placing so much emphasis upon this bridge-period between the elementary and secondary stages in education.

The Sample Groups Examined.

The progress of the pupils originally encountered at Grade VIII was followed for periods varying from one to four years. All were attending school of their own volition as there is no compulsory education in the Province of Quebec. Successful completion of elementary school is implied when a pupil is in Grade VIII, but of course there are several selective factors affecting this achievement. Some pupils pass Grade VII examinations while others fail; some continue into secondary school while others drop out. Control groups were necessary to provide some data concerning these selecting factors. One such group was composed of Grade VII pupils drawn from schools in the city. A second consisted of boys who had left school and were unemployed. Groups were also secured to throw light on two additional aspects of the investigation. First, a number of high school graduates were examined for the purpose of vocational guidance, and this provided supplementary material for the analysis of those qualities necessary for high school success in Montreal. Secondly, psychological tests were administered to a varied group of pupils attending the elementary, secondary, and technical schools in a small industrial centre of the Province, making possible some control comparisons between the pupils attending schools in the metropolis and those in smaller communities.

Boys from two Montreal secondary schools were originally selected for examination. The choice was arrived at after consultation with a group of educational officials and school principals, who agreed that these two institutions provided a heterogeneous selection of pupils representative of the remaining schools in respect of mental ability,

¹ Protestant Board of School Commissioners of the City of Montreal.
Annual Report 1933-1934, p. 4.

social environment, and economic opportunity. As the interest of the investigation shifted to school marks, it was considered advisable to include a group of pupils from a third secondary school as school marks are subject to variation for reasons extrinsic to the pupils writing the examinations.

In all, twelve distinct groups totalling 2853 pupils were investigated. Eight of these were recruited in the three secondary schools referred to, one from eleven elementary schools in Montreal, one from the ranks of unemployed (English-speaking) adolescents, one from graduates of various secondary schools in Greater Montreal, and one from a small industrial city in the province.¹ These groups are sufficiently varied to permit comparisons which will illuminate many of the problems confronting vocational guidance in Montreal.

The three secondary schools (referred to in the text as Schools A, B, and C) are not similar in all respects. School A offers pupils entering Grade VIII three courses of study. Two of these lead to matriculation and differ only in the fact that some pupils elect General Science in place of Latin; these differences become accentuated in the tenth and eleventh grades. The third course (the General course leading only to the School Leaving Certificate) was only introduced in September 1932. Pupils entering any of the Grade VIII classes in September 1931 comprised one group; those entering in September 1932, formed a second group.

School B differs in certain respects from School A. Students here have their choice between two optional courses when they enter Grade VIII. They could take a matriculation course similar to the one followed in School A by pupils studying Latin; or they could follow a commercial curriculum. Four groups were secured from this school, and pupils were separated according as they completed Grade VIII in June 1932 or June 1933. A further differentiation was made in each of these groups according as the students were following the academic (Latin) or commercial courses of study. The Science course was an available option only at Grade X.

School C differs from both Schools A and B in giving two years of commercial training. Pupils entering this school in September 1931 formed one group, those entering in September 1932 the second.

What were the differences and similarities in these groups which warranted their inclusion in this study? Pupils entering a particular high school in two consecutive years were studied principally to discover any chance factors which might bring into question the validity of conclusions reached. Further, groups were compared in different schools because of the possibility that conditions peculiar to one particular school might bias conclusions. Some of these differences may be more significant than the differences in curricula. Thus there is a racial difference in the groups since School B is attended largely by Jewish students. Few of these are found in School A, while the majority in School C also are Gentile. Again, promotions were semi-annual during 1931 and 1932 in Schools B and C, while in School A they were annual. This also is significant. The follow-up study which was carried forward for one to four years with each group was conducted through an analysis of June examination marks. All pupils promoted to a given grade in School A would be found in that grade the following June if they had not left the school. Some pupils promoted in Schools B and C on the other hand would be unable to do the work and would fail in January. This may be expected to have the effect of raising the average school marks in Schools B and C above those of School A. This fact must be taken into consideration when school marks are compared. Finally, there are some important differences in the data obtained from these secondary school groups. School marks alone were secured for pupils in School B, mainly for the purpose of providing controls for marks obtained in Schools A and C.

¹ A detailed description of these groups is presented in Appendix A.

Standardized tests of intelligence and school achievement were given to the boys entering Grade VIII classes in Schools A and C in September 1931. Identical tests were used in both schools, and both were administered after school hours. Before proceeding, it was imperative to answer the question, to what extent are data valid from tests given after school? Psychological tests were therefore administered the following year (in 1932) to Grade VIII pupils in the same schools during school hours. These later tests were not identical with the former in all instances, and the 1932 classes thus provide material on this additional qualification besides the main objective of the study.

It was intended originally to restrict the study to an examination of boys, and this was done in the classes commencing school in 1931. The following year, however, a certain amount of data was secured from girls, to provide some indication of whether conclusions reached from an examination of boys should be regarded as peculiar to them.

As already emphasized, not all the pupils who reach the final year of elementary school enter secondary school. The boys and girls included in the group of seventh grade students provided a cross-section of the schools which supply high school students in Schools A, B, and C. Some of these boys and girls had been in Grade VII for only a few months, while others were completing their year. They were not given psychological tests identical with those used for the older students, for three reasons. First, they were somewhat younger than the Grade VIII students and certain of the tests could not be used. Secondly, they were examined in the spring of 1933 two years after the study had been instituted, and by this date certain of the tests had been shown to have doubtful validity. Thirdly, these pupils were examined primarily to determine the conditions which lead to successful work in elementary school, whereas the secondary school pupils had been examined to evaluate the prognostic value of certain tests.

The group of unemployed boys were given the same tests as were administered to Grade VIII pupils in Schools A and C. This was intended to provide a comparison between boys attending school and those who drop out. Large differences were found between the two types of youths, but unfortunately it was not possible to follow this up.

The group composed of high school graduates differed from the secondary school students in the important respect that they were older and had had four years secondary schooling. The data were obtained when the graduating classes in all high schools of Greater Montreal were invited to secure vocational guidance at McGill University. Over 100 applications were received and 73 boys were given this service. The tests given differ in several respects from those administered in Schools A and C and it is not possible to be certain that this group is typical of all high school graduates. None the less the results have considerable comparative interest.¹

The Techniques Employed.

Psychological tests were given all pupils examined with the exception of those in School B. A measurement of intelligence was included in every instance. The remaining tests varied with the group. Reading and arithmetic achievement were given special consideration in several of the groups. Achievement tests designed to measure knowledge of English usage, spelling, literature, and French, were included in some of the batteries of examinations. Measures of clerical and mechanical abilities were also secured for some boys. Certain claims have been made for "prognostic tests" in certain school subjects, and

¹ It was hoped that the data secured from one city outside Montreal would be of value in generalizing conclusions, another difficulty was encountered in the fact that there were too few pupils in each grade in this second city to permit of reliable comparisons.

two of these, one in geometry, the other in Latin, were employed. The detail of these tests is discussed in later chapters.

A substantial amount of information was secured concerning the cultural background of individuals in some of the groups. Questionnaires completed by the boys and girls were mainly relied on, but they were supplemented by interviews with a limited number of high school students in Grade IX and with high school graduates. School marks provided the other chief source of information. These were obtained on a comprehensive scale annually from the school records.

Two types of technique were employed to analyse this raw material. In the examination of pupils who select various optional courses of study, an analysis was made of the quantitative data available concerning pupils who entered each of the courses of study. Thus intelligence test scores for pupils taking the academic (Latin) course were compared with those for students taking general science or commercial subjects. A picture can be drawn in this manner showing the typical characteristics of pupils in each of the courses of study.

A modification of this technique is necessary in examining school progress. It is here desired to determine those factors which lead to high school success in the various courses of study and which differentiate the students following each of the courses of study. This aspect of the problem was studied in the three following ways. (1) Statistical comparisons were made between scores on psychological tests, and school marks received subsequent to the administration of these tests. (2) Successful pupils were compared with unsuccessful ones in respect to their scores on the various tests administered. (3) Successful students in one course were compared directly with successful students in the other courses.

The value of these four principal techniques are twofold. They permit exact quantitative comparisons. And they enable comparisons to be made on the basis of data secured when the pupils were in Grade VIII. Thus the effectiveness of prognosis of success in optional courses can be determined. On the other hand, the chief weakness of the techniques is that qualities which cannot be measured in quantitative terms may be the determinants which lead some pupils to success in one course where they would fail in others. This qualification will have to be kept in mind in what follows.

Chapter 3

The Relevance of Cultural Background.

A thousand and one occupations stretch out in a great vista of apparent opportunity before the growing boy or girl. But insurmountable difficulties block the road to many of these goals. Lack of ability, training opportunities, and money place effective barriers between the individual and many kinds of work. There remain hundreds of other fields of endeavour, but even among these the most practical-minded boy likes only a few. Why does only one occupation among twenty attract a particular boy? Theoretically he should be able to fill a number of positions; actually he may be unable to master even the one upon which his heart is set. Why? The answer is not necessarily found in his abilities; he may have all of these, and still feel maladjusted. It is not found in his lack of achievement; this could be remedied.

The reason one pathway looks desirable, the others unattractive, is found in the subtle attitudes and the interests which develop with experience in the world. These are not mysterious and unexplainable. They are not heaven-sent revelations, nor the working of "sheer intelligence". They are the result of training in the home and in the school, the interaction of the growing boy and his environment. Home influences probably play the major rôle in this developmental process. Many a boy "wants to be" an office clerk or a physician rather than a machinist. Many a girl "wants to be" a social worker or teacher rather than a factory worker or milliner, and she devotes all her energy towards one of these careers to the exclusion of being a housewife. The preference for one vocation rather than another is not the result of decision arrived at from an unbiased consideration of possibilities in each of the available careers. It may, in fact, often be directly contrary to the decision which could be expected from the most elementary consideration of facts.

This same tendency often appears in the choice of a high school course. There is no objective comparison of available courses of study, no weighing of further education against immediate employment, or against skilled trades which may be learned. Lack of properly organized information is undoubtedly part of the reason. Limited choices in the curriculum obviously narrow down the area of decision. But there is also a tendency for a quick acceptance of one course as "best" and as "the only course for me". Real or fancied facts which support this decision are marshalled against any information which might stand before the desired goal. Current statistics indicate that only 3 per cent of young Canadians attend universities. There is perhaps a reasonable expectation that 10 or even 20 per cent of 13 year old children will ultimately go to college. Both of these figures might properly be higher; but they are not likely to be increased rapidly in the next few years. Yet a large majority of pupils entering high school insist on taking a matriculation course.

It is usually the parents, not the child, who decide which high school course shall be followed. They also often decide upon the career subsequent to school. But this is no more likely to be correct merely because it is initiated by the parents.

The youth, for his part, is usually fairly easily satisfied by the thought of the school course or occupation which has been "chosen". The decision satisfies his self-regarding sentiment; but this has developed through experience. It could just as readily have been focussed upon another career. The reason that one decision is satisfying, another not, is found in the home situation. The attitudes, life and problems of the parent determine the structure of the self-regarding sentiment in the child. Any action designed to change the child's attitudes toward vocation or education must therefore take account of this situation.

The cultural background of pupils must be brought into the data for vocational guidance for another reason. The curricula choices selected by the pupil are determined prior to the date upon which he informs the school authorities of his decision. It is admitted that the choice stated on this latter occasion may be changed under compulsion from school or home. But a misfit will develop if emotional satisfaction is not found. This is a serious situation. The career or school course necessary to enhance the self-regarding sentiment may be one which the individual cannot master because of faulty initial preparation, lack of the requisite abilities or personality characteristics, or for financial reasons. The mere insistence upon a career in keeping with potentialities may produce a misfit. A plasticity of fields within which his "drives" and interests can find satisfaction will result only from a home up-bringing designed to develop this characteristic. What kind of training is this? Important clues to the answer can be found from examination of the homebackground of pupils from the view-point of psychological development.

There is another equally important reason for investigating the cultural background of students. It has been found, wherever an investigation of mental calibre in relation to school achievement has been carried out, that many pupils have difficulties in spite of abilities adequate to meet the "learning" situation that confronts them. A quantitative analysis showing the relationship between school progress and the abilities or initial achievement of the student fails to measure the problems properly. The pupils are shown as failures, but explanations of this situation cannot be made. The cause may lie within the pupil's attitudes or emotional adjustments, in his relations with the school or with the home. It is directly or indirectly within the home that the explanation will most likely be discovered for such lack of success. The dominant rôle played by home in the personality development of the individual is generally recognized. If attitudes built up here are not satisfactory, conflict within the boy's own mind or between him and the school will be irresistible. This may show itself in several ways. Conscious or semiconscious defeatist attitudes may be symbolized by expressions such as: "What good will algebra be to me? I'll never use it". "The teacher picks on me and won't give me a chance". "I just can't learn Latin; neither could Dad", "I can't concentrate". "They won't let me play hockey. They say I can't do that and keep up with my studies. Well who'll make me study?" These "reasons" could be extended indefinitely. The school and vocational failure of such a boy or girl will continue until the true sources of difficulty are discovered and corrected. A modification of home environment may be necessary. The problem is almost hopeless where the school or went to work.

In the present study, it was not possible to investigate the home background of large numbers of secondary school pupils. No attempt was made to estimate the more subtle influences within the home which were moulding the attitudes, ambitions and achievements of these pupils. But some of the major features which differentiate home backgrounds are amenable to statistical treatment and are illustrated herein.

Two broad factors were examined which are closely associated with the cultural background of the boys. These are the languages spoken at home and the occupations of the fathers.

Studies of bilingualism tend to indicate that the use of two or more languages by children mitigates against their complete mastery of either. It has been suggested that greater or less mental retardation may be brought about through the introduction of the second language prior to the incorporation of the first in the child's personality.¹ While it is advisable to consider individual cases on their own merits,

there is a distinct possibility that school difficulties will be encountered by the pupil brought up in a home where a foreign language is spoken. Will this have any general adverse effect upon either his school marks or his rating by psychological tests at the secondary school level?

Bilingualism may have a second adverse effect. The child speaking two languages is confronted with a double problem; one aspect of this concerns itself with the language, the other with the larger social situation. Time after time such a child is called upon to make decisions, both as to words which shall be used and as to behaviour which is acceptable. Mental conflicts may arise wherever such decisions are necessary, which the child with only one language and one social background escapes. It is now well known that mental conflicts resulting from a left-handed child being forced to use his right hand often lead to the development of a state of "nervousness"; it is probable that a similar result may occur when other conflicts arise through this other motor habit of talking. Secondly, there are social conflicts. The child brought up in one community accepts the mores of that community without question. The bilingual child is brought up in two environments one the English Canadian culture he meets in school, the other the culture of the minority group to which his parents belong. Here again there is a necessity for judgment and decision in respect to problems, actions, and ways of living which are accepted without question by the English Canadian boy or girl. These conflicts provide additional possibilities of "nervousness" developing. Such a condition may easily affect attitudes, and through these, school work.

The problems of bilingualism were encountered in the later stages of the study. Information had been collected, in the first years, on the languages spoken at home by boys attending Grade VIII classes in Schools A and C, by Grade VII pupils, unemployed boys, and high school graduates. Members of these groups were simply asked what languages they spoke at home other than English. The question did not permit differentiation of the degree of bilingualism, and was unsatisfactory in this respect. Two languages may be expected to affect the pupil who hears and speaks only a foreign tongue at home more than, for example, the one who speaks this language only if the grandparents visit. Nevertheless by grouping together all bilingual individuals, and comparing their test scores and school marks with those of English speaking students, any general differences will be discovered if these exist, and this procedure was accordingly followed.

The social position of a family may affect the home environment of the pupil in more subtle ways than might be expected. One school principal preferred a school in one part of the city rather than another because he found that parents in the "working-class" districts had a more intelligent interest in the educational welfare of their children than those in the "white-collar" districts. He meant that the white-collar parents are more insistent that their children "complete school", but they tend to be uncritical of the quality of education and often give less support to the school authorities. Pupils included in the present samples lived in widely scattered sections of Montreal. A majority lived in the wage-earner districts, but an insufficient number of students were included from the "white-collar" districts to permit direct comparisons between the two.

The social and economic position of the family is, however, in part dependent upon the occupation of the father. A perfect agreement between cultural and economic status cannot be expected. But, in general and for large numbers of individuals, some relationship should exist between these factors. Many studies have shown a relation between educational achievement and intelligence, and between the latter and occupations held. Certainly the cultural background of the home is affected by education. Where pupils are segregated according to the occupation of the father we may expect some differentiation on the basis of broad cultural differences to appear.

Information on the normal occupations of fathers was secured from Grade VII and Grade VIII students, high school graduates and unemployed boys. Emphasis was placed upon normal occupations as many men were out of work or had secured temporary employment at the time of the enquiries. The temporary job or the fact of unemployment would not have provided any index of cultural differences between the men.

Two serviceable systems - those of Burt and Barr¹ - have been designed to differentiate jobs on a scale of intelligence. Burt classified work into the following eight categories: (1) higher professional and administrative, (2) lower professional, technical and executive, (3) clerical and highly skilled, (4) skilled, (5) semi-skilled repetition, (6) unskilled repetition, (7) casual labour, (8) institutional. This plan was adopted where gross comparisons were made between groups but where the comparisons have to be detailed, Barr's rating scale is more suitable. It provides a method for treating occupational status in numerical terms, one hundred representative jobs having been assigned probable error values based on rankings of intelligence required for these positions. The ratings vary from zero (a hobo) to 20.71 (inventive genius). Since Burt's scale is more adaptable to gross comparisons of groups it was followed for most of present analysis.

The use of these two scales make available comparisons of psychological abilities, educational status and achievement, and interests when the boys are divided into broad cultural groups. This information is not enough to answer all the questions raised in the early part of this chapter. But a more direct approach was made to the study of the personal interests of the boys examined.

The thirteen-year-old lad's desire for a particular secondary school course presumably depends upon his interests at the moment. These may be stable or they may fluctuate for no apparent reason. Nevertheless they have developed from the life experiences of the child. Their complete explanation can only be found by an analysis of the psychological background of the individual, which was not the objective of this investigation. A rougher guide, but a practical one - because it is a choice which every boy must in some fashion make - is found in the interests which lead one boy to study Latin, a second general science, and a third commercial subjects. A decision between the three options had been made by each boy before he entered Grade VIII. There are distinct differences in the occupational fields open to boys who take the commercial course rather than a matriculation one. The interests which lead to the adoption of one rather than the other should be definite. Such differences should be disclosed through answers to the "Analysis of Work Interests" blank.

Miner's "Analysis of Work Interests" questionnaire was completed by the Grade VIII boys of Schools A and C. This was filled in at home and the answers provided information on the school subjects preferred, desired conditions of work, extra-curricular activities, general types and kinds of work preferred, and the occupations most desired. An analysis of this data was made for pupils in Grade VIII in each of the three courses of study. Later the data were again tabulated for boys who had proved successful in the first three years of their courses. No comparisons were made between answers and test scores or school marks, as it was impossible to reduce the former to scores.

Grade VIII students had elected their secondary school course when the Interest schedule was completed. What factors if any can be observed in the final year of elementary school which lead this youth

¹ a. Industrial Fatigue Research Board, Report No. 33. *A Study of Vocational Guidance*. (London: H.M. Stationery Office, 1926). Part II: Spielman, W. and Burt C., "The Estimation of Intelligence in Vocational Guidance".

b. Terman, L.M. et al. *Genetic Studies of Genius*. Stanford University Press, 1925, Vol. I, pp. 66-72.

to study Latin, that to go to work, a third to take a commercial course? These questions could be answered through the medium of psychological test scores when pupils were divided on the basis of replies to two questions: "Are you planning on going to high school next fall? If so, what course will you be taking"? Spontaneous responses were desired from pupils and no explanations were given of secondary school courses.

Considerable material was secured concerning both the interests and cultural background of the adolescent, through a questionnaire completed by the parents of the high school graduates who were given vocational guidance. This was supplemented through an interview, lasting an hour, with each boy. Our most complete information concerning general background and interests is in reference to these students.

The sentiments of the individual, his attitudes developed in the home and school find expression through personality characteristics. Psychological tests have recently been devised to measure certain of these non-intellectual factors, but few were available at the time. Moreover, there was no evidence as to their validity when given to boys aged from 12 to 14 years.

Students in the upper years of high school, however, may be sufficiently mature to interpret inventories of personality traits. The Personality Inventory designed by R.G. Bernrueter was completed by the Grade X, XI and XII students from the high school in an industrial community outside Montreal. Responses were scored with respect to four aspects of personality: neurotic tendency, self-sufficiency, introversion-extraversion, and dominance - submission. A similar test, designed to indicate tendencies toward introversion and sensitiveness, was completed by the high school graduates given vocational guidance.

In the vocational and educational guidance given, particular attention was paid to the personality characteristics of the high school graduates examined. Recommendations were made principally on the basis of the personality tendencies and the emotional adjustments of the boys. Abilities provided a frame work of fields within which an occupation had to be chosen. An adequate rating of personality is not atomistic; it considers the individual as a whole, and it was recognized that the particular "best plan of action" for each boy could only be determined through a very careful evaluation of his non-intellectual characteristics. The relevance of data broken down into mutually exclusive traits may well be questioned. The case-study approach to the examination of personality which was instituted with this small group of high school graduates is much preferable to an analytical treatment of numerical scores each of which represents one trait. Even this latter technique, however, if the data are reasonably reliable, is preferable to a total neglect of the problem of personality adjustment.

It is not claimed that these measurements of the "non-intellectual" aspect of school adjustment are adequate to explain all the difficulties faced by many students who would otherwise possess the abilities necessary to succeed in their course. The investigation none the less meets some pressing needs. Both parents and school authorities tend to neglect the complex factors existing in the home which retard or prevent school progress. There are no student counsellors, special courses, or reference-sources of occupational or educational requirements. No clinics exist for the treatment of personality difficulties which adversely affect school work.¹ This justifies the emphasis of this study, which may appear to some excessive, on factors other than

¹ The failure on the part of the majority of parents to realize the importance of the home situation in developing attitudes, habits and character favourable to the highest development of their children, is seen most clearly in their placing full responsibility for failure upon the child. Correction of the difficulties on any large scale will be impossible, also, so long as parents feel their own judgments on education are sufficient.

the "intellectual" abilities and achievements. Natural abilities, the school he attends, the financial position and ambitions of the child's parents are concrete realities recognized by all. But the less tangible qualities may be just as real and far more important in his actual ability to develop achievement in school subjects and to use the abilities which he possesses.

Vocational guidance in practice must take account of these emotional sources of maladjustments. But this requires the whole-hearted co-operation of both home and school. The school system at present makes no provision for remedial training and for the mental health of the children in attendance. Vocational guidance in such a system must necessarily restrict itself to prognosis on the basis of abilities and achievements, and important elements in a pupil's development may be overlooked.

In the following chapters it must be remembered that the illumination of the background of the sample groups is meagre. Theoretically this is unfortunate; practically it is not a handicap. It serves to remind the reader of the limitations of the school structure and of examination measurements. Where there are no cumulative records to indicate the educational, mental and physical growth of students, teachers have but scant knowledge of their pupils' previous development and achievement.

Chapter 4

The Evaluation of Mental and Educational Status.

For the assessment of mental and educational levels among the boys and girls studied, this survey relied largely on the results of standardized psychological tests. What are these tests and what concepts are implied in such terms as "intelligence", "clerical ability", etc? How do "standardized achievement tests in arithmetic" differ from school examinations in this subject? It is necessary to know this to appreciate the sections which follow. The purpose of this chapter is to describe the tests in general, but also to note the chief relationships found between the measurements of intelligence, special abilities and various aspects of school achievement. It will be helpful to deal separately with (a) general intelligence, (b) special abilities (particularly clerical and mechanical aptitudes), (c) educational achievement, and (d) the prognosis of the latter by means of specially designed tests. Each test will be considered on the basis of the merits claimed for it, and each one evaluated in reference to others.

(a) General Intelligence.

Psychologists do not completely agree upon a detailed definition of intelligence, nor do they agree upon what intelligence tests measure. But most writers (in their definitions) emphasize adaptability to life situations.¹ A gap exists between definition and the practical realities of test construction, but the tests measure the adaptability in indirect ways.

Certain occupations such as the professions and higher administrative positions demand a greater adaptability of the intellectual processes than do occupations such as the skilled trades. These in turn require greater adaptability than jobs classified as "casual labour". A famous mass measurement of this hierarchy was made when the civilian occupations of recruits to the United States Army during 1917-1918 were classified on the basis of average intelligence test scores. Occupations classified did not prove to be completely differentiated, but a definite tendency was noted for those positions requiring intellectual adaptability to rank at the top. More recently the same procedure has been followed in other less extensive investigations and the results have been consistent. It may be concluded that intelligence, as measured by tests described by this name, does differentiate broad occupational groups. A similar tendency can be noted in respect to education. There is a concomitant variation of levels of education with occupational status.²

Account must be taken of these facts in vocational guidance. A boy's intelligence will be a basic factor limiting his educational possibilities. His actual educational achievements in turn will limit the careers from which he may choose. In vocational guidance intelligence tests may be of value in two ways. Their scores may indicate that a boy can enter certain occupations if he attains the educational status necessary. Again, they may indicate that he stands a reasonable chance of succeeding in one rather than another course of study. These two rôles of the intelligence test in vocational guidance, of course, have affinities. We should expect that more intelligence is necessary in the advanced grades of a particular course of study than in the lower grades. Differences should also exist in the intellectual stand-

¹ Garrett, H.E. and Schneek, M.R. *Psychological Tests, Methods and Results*. Harper and Brothers, New York, 1933. Part II, pp. 3-4.

² Morton, N.W. in *Occupational Abilities* (McGill Social Research Series No. 3, 1935) discusses in detail the relationship between intelligence test scores and occupational and educational status. cf. Chapters II, III.

ards of pupils following different courses if these lead to different occupations. Further, the greater the intellectual differences required for the occupations available to graduates of two courses the greater should be the differences in intellectual level of pupils completing the two courses. A similar conclusion should be reached if students completing a course are compared with those who drop out.

The majority of pupils investigated were following curricula designed for university matriculation. These boys and girls were presumably planning on entering university or at least entering positions demanding an equivalent mental ability. Whether the matriculation is a proper index of employment ability or not, it is so regarded in the business world and the opportunities of graduates from such courses should be greater than those for students dropping out of high school. The presumption is therefore that boys and girls finishing school should be more intelligent than those not completing their course. To what extent do we find these conditions in the Montreal schools? This question can be answered from observations of pupils subsequent to their being given intelligence tests.

There are many misconceptions concerning intelligence tests. They are not perfect instruments which provide an absolute measure of a child's intellectual ability. Rather they are tools which enable the examiner to compare one pupil with another in a systematic manner. In the typical test, problems are presented to the child which require him to manipulate words or ideas. His success or failure is compared with that of other children on a large number of these problems. The more carefully constructed tests can be applied to a child at different stages in his development and consistent results will be obtained. The kind of question which comes within the mental world of a child varies with his age and education. Consequently no one test is useful at all ages and certain ones may have little utility for individuals with a limited educational background.

Four different tests of intelligence were used in various parts of this investigation: the Otis Self-Administering Tests of Mental Ability, Intermediate and Higher Examinations, the Revised Alpha Examination, Form 5, and the Revised Beta Examination.

Measures of general intellectual ability obtained from these four examinations should be closely related if all involve similar psychological functions. The Revised Beta Examination consists principally of pictorial test material while the remaining tests rely upon written problems. Each of the four examinations is sufficiently reliable to permit individual diagnosis.¹ Do the four examinations measure the same psychological ability? This question is of fundamental importance. Each test was designed to measure "general intelligence" and each is self consistent. If they measure the same ability close agreement will be found between scores when two or more of them are given to a group.

The two Otis Self-Administering Tests of Mental Ability - Intermediate and Higher Examinations - were not given to identical groups. Their author, however, reports² the average coefficient of correlation³ between the two as .84 for four groups of about 100 cases each in Grades VIII to IX. The two tests have been considered as comparable; in the present investigation where the I.Q. is the measure under consideration, they are not differentiated. The use of one rather than the other was determined by the group tested; boys older than fourteen

¹ The reliability of a test is the extent to which it is consistent. This consistency may be either internal or based on a comparison of scores with those obtained when the group is retested with the same or a similar device. Reliability is computed statistically and is expressed in the form of a coefficient of correlation.

² Otis, A.S. *Manual of Directions for the Otis-S-A Tests of Mental Ability*. World Book Co., Yonkers, N.Y., 1928.

³ See footnote³ on following page.

or advanced beyond Grade VIII in school were given the Higher Examination, while for those of fourteen years or less and those in Grade VIII the Intermediate Examination was used.

The interrelation of test scores may be analyzed either vertically or horizontally. That is, marks of pupils in several grades may be compared, or the comparisons may be restricted to a one-grade level. A higher agreement may be expected in the former case where the range in ages and in education will affect the coefficient.¹ This greater range can, however, be controlled by the method of partial correlation.² A vertical study of the relationship between test scores is necessarily restricted to data obtained from pupils attending school in the industrial centre outside Montreal as all other groups were confined to one grade.

Horizontal studies within a one-grade range were made between scores on the revised Alpha Examination, Otis S-A Tests of Mental Ability and Revised Beta Examination. The coefficient of correlation³ between Otis and Army Alpha was $.70 \pm .04$.⁴ This agreement was secured in spite of the fact that the Otis was given five months later than the Army Alpha and was administered only to students who successfully completed Grade VII and entered the Grade VIII classes of School A. This correspondence may be considered high in view of this adverse factor. These two tests apparently measure much the same psychological abilities.

On the other hand, the agreement between the results on the Revised Beta Examination, and the Army Alpha and Otis scores was statistically significant but not as close. The coefficient secured in one grade between Army Alpha and Revised Beta was $.36 \pm .03$; between the latter and Otis scores it was $.33 \pm .07$. This correlation was raised to $.53 \pm .07$ where data were combined for four grades, and, when age was held constant, the resultant partial correlation was $.48$. Statistically the Revised Beta Examination may provide a measure of the abilities sampled by the Revised Alpha Examination or the Otis Self Administering Tests of Mental Ability. Nevertheless this reliability is not sufficient to permit the substitution of the Revised Beta for either of the other two tests.

This incompatability between scores on the Revised Beta and scores on the other tests makes continual differentiation of them essential. The term "intelligence test" will refer to the Otis or Army

¹ Kelley, T.L. "The Reliability of Test Scores". *Journal of Educational Research*, May 1921, p. 374. The author shows that the magnitude of the coefficient of correlation clearly depends upon the particular groups studied. A reliability coefficient of .40 if secured in a single grade is probably indicative of greater reliability than one of .90 from an eleven grade range.

² This is a mathematical device for finding the correspondence between two sets of measurable data when the correlation coefficients are rendered spurious by the presence of one or more factors affecting both sets of data. The method of partial correlation makes possible the holding constant of conditioning factors by means of statistical formulae.

³ A coefficient of correlation is a mathematical expression of the extent to which one set of quantitative data varies directly with a second set. Coefficients of correlation vary from -1 through 0 to +1. The significance of a coefficient is determined by its magnitude and the number of cases it is based upon. The forecasting ability of a test may be determined by a knowledge of the correlations coefficient between scores on this test and on a second measure. For example, a correlation of .50 has a forecasting efficiency of only 13% greater than a chance forecast. The following figures indicate the forecasting efficiency (E) of correlations (r) of various magnitudes:

$$r = .60 \quad E = 20\% \quad r = .80 \quad E = 40\%$$

$$r = .70 \quad E = 29\% \quad r = .90 \quad E = 56\%$$

⁴ $\pm .04$ is the probable error of the correlation. A correlation is significant when it is more than four times its P.E.

Alpha examinations except where the Revised Beta Test is specified. As the Army Alpha was given only to Grade VII students, it can be differentiated from the Otis S-A tests by the context.

The only special abilities measured in this investigation were clerical and mechanical aptitude. Our consideration of these must deal with three questions: (1) To what extent do various tests designated by a common name provide measures of identical mental functions? (2) What relationships exist between measures of different abilities? (3) What is the relationship between these special abilities and intelligence?

An examination of statistical measures of agreement provides answers to these questions. The statistical agreement between scores on two tests, must be indicated by a correlation coefficient of at least .81 or the two cannot be considered for purposes of individual diagnosis or valid measures of the same mental functions.¹ When comparisons are restricted to groups,² however, a correlation of .50 is sufficient to warrant the substitution of one test for another. Imperfections in the construction of tests and temporarily disturbing factors in the individual examined are sufficient reasons for a lack of complete agreement between two tests with the same general name. Experience has indicated that perfect agreement cannot be secured.

The examination of mechanical ability was to some extent subsidiary, since among the pupils tested, no group of the Montreal pupils tested was following a course of study leading to careers which directly utilized this ability. In other words, boys from technical schools in the province were not covered in this study. Five tests of mechanical ability were given students in one or another group: (1) Stenquist Mechanical Aptitude Test 1, (2) Minnesota Paper Form Board, (3) Revised Beta Examination Test 4, (4) Mechanical Assembly Test (Minnesota, Shorter Form), (5) Cox Mechanical Aptitude Tests, Series 1 and 11. Three of these were given to only one group: the Stenquist Mechanical Aptitude Test and the Cox Mechanical Aptitude Test were used only with the pupils attending school outside Montreal, while the Mechanical Assembly Test was administered only to high school graduates. These students were also examined with one form of the Minnesota Paper Form Board test as were the 1931-1932 Grade VIII classes of Schools A and C. Two forms of the paper form board test were given to the unemployed boys.

Each of the above examinations has been recognized as providing measures of mechanical ability. Such recognition has not yet been accorded to Revised Beta Test 4,³ which was administered to Grade VII pupils, the unemployed boys, and part of one Commercial Group. Consideration of this examination as a test of mechanical ability is justified, however, by the high agreement between its scores and those obtained on the Minnesota Paper Form Board. The observed correlation between the two was .87 ± .02. This high coefficient warranted the conclusion that identical mental functions were measured by the two.⁴ Beta Test 4 was, therefore, accepted as a group measure of mechanical ability, although its scores are not sufficiently reliable to warrant individual prognosis.

¹ Kelley, T. L. *Interpretation of Education Measurements*. World Book Co., Yonkers, N.Y., 1927. Kelley shows that the reliability of a test must be .90 before it can be considered sufficiently reliable for purposes of individual diagnosis. A correlation between "true" scores on two tests will be .90 when the observed correlation coefficient is .81 provided the reliability of each is .90. (Spearman's correction for attenuation as in Holzinger, K.J. *Statistical Methods for Students in Education*).

² Kelley, T.L. op. cit., p. 29.

³ Kellogg, C.E. and Morton, N.W. "Revised Beta Examination". *Personnel Journal*, Vol. XIII, (1934), pp. 94-100.

⁴ The re-test reliability of test 4 is reported by its authors as .74 for 60 Grade VI pupils.

The relationships between these various tests of mechanical ability are not high. The following are the coefficients of correlation obtained in a one-grade range:

- (1) Stenquist Mechanical Aptitude and Revised Beta Test 4 $r = .44 \pm .16$
- (2) Stenquist Mechanical Aptitude and Cox Mechanical Aptitude $r = .45 \pm .16$
- (3) Mechanical Assembly and Minnesota Paper Form Board $r = .52 \pm .06$
- (4) Cox Mechanical Aptitude and Revised Beta Test 4 $r = .70 \pm .08$

Only the two last coefficients are statistically significant; the first two must be regarded as indicative of chance relationships. The coefficients, however, are based on data from only 12 to 15 boys except for the one between the Mechanical Assembly Test and Minnesota Paper Form Board. The Cox Mechanical Aptitude Test and the Revised Beta Examination Test 4 are not sufficiently reliable to justify the use of correlations based on such meagre data. Somewhat higher agreements exist in the four-grade range available for pupils attending Grades VIII to XII in classes outside Montreal. This is shown in the following correlation coefficients:

- (1) Stenquist Mechanical Aptitude and Revised Beta Test 4
 $r = .54 \pm .07$, or with age held constant $r = .47$
- (2) Stenquist Mechanical Aptitude and Cox Mechanical Aptitude
 $r = .70 \pm .05$, or with age held constant $r = .65$
- (3) Cox Mechanical Aptitude Test and Revised Beta Test 4,
 $r = .69 \pm .05$, or with age held constant $r = .65$

Each of these is statistically significant. The three tests involved - the Stenquist Mechanical Aptitude Test Series 1, Revised Beta Examination Test 4, and the Cox Mechanical Aptitude Test Series 1 and 11 - provide measures of an aptitude sharing something in common. Where large heterogeneous groups are compared the three can be regarded as measures of the same mechanical ability. The data presented, however, do not justify the extension of this conclusion to comparisons of scores made by individuals.

A certain amount of agreement may be anticipated between test scores for intelligence and mechanical ability. The coefficients of correlation between tests designated by the title "measures of intelligence" and "measures of mechanical ability" are shown in Table 1. The only tests between which there was a significant amount of

Table 1. Coefficients of Correlation Between Measures of Intelligence and Measures of Mechanical Ability.

Intelligence Test	Mechanical Ability Test	Coefficient of Correlation		
		Range 1 Grade	Range 4 Grades	
Otis S-A	Mechanical Assembly	.10 $\pm .08$	-	
	Minnesota Paper Form Board	.31 $\pm .07$	-	
	Beta, Test 4	-.07 $\pm .16$	.47 $\pm .07$	.38
	Cox	.45 $\pm .13$	.53 $\pm .07$	.45
	Stenquist	.27 $\pm .20$	.35 $\pm .08$	.21
Revised Beta	Cox	.70 $\pm .10$	.38 $\pm .08$	.33
	Stenquist	.47 $\pm .16$	.34 $\pm .08$	.25

agreement, within one school grade were (1) the Otis and Minnesota Paper Form Board and (2) Revised Beta and Cox. The relationship between intelligence and mechanical ability tests was small but significant in each case when the grade and age-ranges were greater. These correlations are too small for the differences to be trustworthy.

The coefficients of correlation that have been presented in this section indicate that the term "mechanical ability" is very loosely used in the construction of tests. Different examinations bearing this name do not measure the same mental functions to any considerable extent. Two tests appear to provide similar scores; the Cox Mechanical Aptitude Test and the Revised Beta Test 4. But these have lower coefficients of reliabilities than the other measures of mechanical ability. The discrepancies in Table 1 between correlations in a one year and a four year range show that little reliance can be placed in the individual's scores on these measures. It must be concluded that where mechanical ability is mentioned, specific reference must be made to particular tests.

Clerical Ability.

Clerical ability cannot be regarded as a special aptitude in the sense of musical or mechanical ability, or even manual dexterity. The term denotes a certain combination of intellectual factors, habits, emotional patterns, and personality characteristics which together are necessary for performance of office duties.

The Thurstone Clerical Examination was the only group test of clerical ability in 1931 which was satisfactory for use in a commercial high school; but the time limit of two hours made this unacceptable. Later the Moore Revision (for North American uses) of the Clerical Test devised in the National Institute of Industrial Psychology became available, and this was administered to the group of high school graduates. However, the need for a prognostic test of clerical ability was recognized early in the investigation and two group tests were developed.¹ These latter examinations, called "M" and "N" Tests of Clerical Ability were not standardized.

No two of these three examinations were given to the same group. Their agreement with other psychological tests was investigated by Morton² who administered both N.I.I.P. Clerical Test and the Thurstone Clerical Examination to a group of unemployed adults. He reported the correlation between the two sets of data as $.896 \pm .024$. The same writer in an unpublished study obtained a correlation of .89 between "M" Clerical Test and Thurstone Clerical Examination scores for 35 unemployed men. The high agreement indicated by these coefficients seemed to justify the substitution of both the N.I.I.P. and the "M" Clerical Test for the Thurstone Clerical Examination.

Coefficients were also calculated for correlation between the Otis Self-Administering Tests of Mental Ability and the two clerical tests (Moore Revision and "M"). In both cases significant but moderate agreement was noted, the coefficients being $.58 \pm .05$ and $.42 \pm .04$ respectively. Little or no agreement was noted between N.I.I.P. Clerical and of mechanical ability test scores.³ The two tests of clerical ability used had high predictive values when compared with the criteria for clerical ability (i.e., the Thurstone Clerical Examination).

¹ Test M consisted of seven sub-tests: substitution (Test 2 Revised Beta); word similarities; picture similarities; letter counting; understanding of directions; error checking; analogies. Test N consisted of the substitution and letter-counting tests of Examination M, the error-checking test in Revised Beta Examination, the analogy, understanding of directions, and 'same - opposite' word-tests of the Revised Alpha Examination.

² Morton, N.W., *op. cit.*

³ Correlations between N.I.I.P. Clerical and (1) the Mechanical Assembly Test and (2) the Minnesota Paper Form Board were (1) $.14 \pm .08$, and (2) $.31 \pm .07$.

The agreement between these and intelligence test scores was low, as would be expected, while the agreement with scores from tests of mechanical ability was negligible.

Educational Achievement.

In educational guidance, a knowledge of a child's psychological abilities must be supplemented by data on his school achievement. Two varieties of measurement are available: scores on standardized educational tests, and school marks. Examination marks are based upon one course of study and include only such questions as can be answered by pupils who have taken a particular year's work in the course. Questions are asked, answers are written by the student. The teacher reads and interprets these answers in marking. A standardized educational achievement test is different. In the first place, it is more objective in that variations in answers are reduced to a minimum. Usually this end is achieved by providing optional answers, the student underlining his choice as the correct one, although there are modifications of this procedure. However, the pupil's answers are restricted in order that different markers must give the same credit for a particular answer. The principal difference between the two is in subject matter although objective tests are often unstandardized. All standardized tests are objective in this sense, and are constructed only after careful study of many courses of study. Questions included are based upon more than one school grade in one course of study. The material in the New Stanford Achievement Tests for example is effective from Grades IV to IX. Pupils are given a specified amount of time to answer as many questions as possible. The general difficulty of the test is determined for each grade in which it can be used and in many instances the exact difficulty of each item is known.

Standardized achievement tests have a high internal reliability and they have proved valuable in broad educational testing surveys, but they are open to criticism when applied to a particular educational system, grade, or school room. They do not examine the specific educational material which must be known by the successful pupil. School marks, on the other hand, are adequate in this respect, but their reliability is unknown. The examination to which they have been assigned may lack objectivity and may have been given to a limited number of pupils.

The reliability of school examinations as measured by these studies will be carefully examined in the next chapter. Here we are concerned first with the nine standardized achievement tests which were administered. Seven of these are included in the New Stanford Achievement Test battery. One or more of the nine were given to selected groups of Grade VIII and IX students in Montreal schools, and to unemployed boys, while one test of reading achievement was given to Grade VII pupils at a later date.

School subjects correspond to certain of these examinations. Where this was the case a moderate agreement was observed between test scores and marks at the end of the school year. Expressed statistically, the coefficients of correlation obtained between school marks and test scores ranged from .4 to .6.¹ The agreement between standardized educational test scores and intelligence test scores was slightly higher, the correlations ranging from about .5 to .7.

The American Council Beta French Test was administered to School A pupils in Grades VIII and IX. These scores are not exactly comparable to school marks in French as the Montreal Protestant schools give equal emphasis to the oral and written aspects of this subject; the Test is concerned entirely with the latter.

¹ Details regarding these coefficients will be found in the Appendix.

A general measure of school achievement can be secured from the total score on the New Stanford Achievement Test. The correspondence between these total scores and school marks was somewhat less than between New Stanford Achievement and intelligence test scores. The two correlations for one group were $.60 \pm .03$ and $.67 \pm .03$ respectively. A comparison of the relative efficiency of various standardized achievement tests in agreeing with school marks demonstrated that the Arithmetic Test in the New Stanford Achievement test battery was as satisfactory as all seven measures.

The data in Table 2 indicate the value of the New Stanford Achievement Tests as a measure of school achievement. The table is based upon scores of unemployed boys whose academic history varied greatly -

Table 2. Coefficients of Correlation Between Test Scores and Other Factors, Among 138 Unemployed Boys.

Criteria	New Stan-ford	Rev-is-ed Beta	Grade Com-pleted	Age on leaving school	Present Age
	1	2	3	4	5
1. New Stanford Average	-	.59	.73	.37	.34
2. Revised Beta	.59	-	.54	.23	.17
3. Grade Completed	.73	.54	-	.61	.30
4. Age on leaving school	.37	.23	.61	-	.20
5. Present age	.34	.17	.30	.20	-

some had completed Grade IV, others Grade XI. The highest relationship ($r = .73$) is between New Stanford scores and grade completed. Test scores are of definite value in predicting schooling or grade completed. They are slightly better in their prediction than age at the time of leaving school ($r = .61$). Age at the time of the examination and at the time of leaving school did not correspond with any of the other factors. Both the New Stanford Test scores and the grade completed corresponded to a significant extent with scores from Revised Beta Examination. ($r = .59$ and $.54$ respectively). The correlation between Otis and Beta scores for the same group is slightly higher ($r = .69$). The data indicate a definite relationship between good showing on the New Stanford test, and school achievement as indicated by the grade completed. The age of the examinee, either at the time of leaving school or when tested, had little bearing on the scores obtained. But there is a practical relationship between the achievement and intelligence test scores. It is clear that those boys who score well on one, tended to succeed on the other. This large common factor must be explained in terms of differences in education. The minor rôle played by age indicates that education is the primary variant, and is not a direct function of age.

Prognostic Tests of Educational Achievement.

A satisfactory test which was prognostic of future achievement would greatly lighten the problem of educational guidance, especially in the choice of optional secondary school subjects. It is not the primary function of intelligence and school achievement tests to predict school achievement, though they are valuable adjuncts. Several tests have been specifically designed to predict future work in certain subjects. Two of these, one for Latin the other for geometry

were administered to School A pupils commencing the study of these subjects.

The Orleans-Solomon Latin Prognostic Test and the Orleans Geometry Prognostic Test were designed to indicate the pupil's ability to handle the situations he would meet in the study of these subjects. There are other factors (including habits of work and environmental conditions), which are important to success in these as in other subjects. The tests themselves consist of a number of lessons in the subject for which a prognosis is desired. These are followed by examinations based on the lessons.

The Latin prognostic test was administered during the first week of school (in September 1932) to all Grade VIII Latin students in School A. The Orleans Geometry Prognostic Test was administered at the same time to all Grade IX pupils commencing the study of this subject. A moderate agreement was observed between test scores and marks in these subjects after a one year period. However correlation coefficients over a two year period indicated that neither test was satisfactorily prognostic for the schools concerned. The moderate correspondence between test scores and marks over a one year period was not sufficient to warrant the prediction of individual marks.¹ Neither could be used by itself as a basis upon which to recommend the pursuance of a course of study involving these subjects.

Summary

From the description of the various standardized psychological and educational tests used in this survey, and from the material in Appendices II and III, certain general implications can be drawn.

The names assigned to tests by authors do not always correspond with the nature of the examinations, as the descriptive terms are ordinarily understood, at least. This was shown in several instances. Two tests described as measures of intelligence were given pupils in one grade, resulting in scores which did not correspond as closely as scores on the intelligence and reading tests. Even greater discrepancies were found when tests of mechanical ability were examined. Scores agreed closely on those tests which included similar material; they were unrelated on tests which appear to be different in construction. Tests should therefore be referred to by name if there is any possibility of confusion.

The construction of standardized educational tests ensures a measure of the breadth of a student's knowledge in a particular subject. But we must be careful to differentiate this knowledge from that required in writing the ordinary school examinations: the two types of marks are not interchangeable. A pupil may be much advanced over his class-mates when compared with them on the basis of one and yet be inferior to them when judged by the other.

It is necessary also to guard against the assumption that a group of standardized tests provides better measures of school achievement than does a single test. This was brought out clearly in one instance: the average mark for the two arithmetic tests in the New Stanford Achievement Test battery agreed more accurately with average school marks than did the total mark on seven of these standardized achievement tests.

What do standardized achievement tests measure? We saw that scores on tests of spelling, literature and language agree with each other as closely as with school work in these subjects. A similarly high agreement exists between them and intelligence test scores. This implies that a large common factor is measured by those tests. However the agreement is not sufficiently high to permit the conclu-

¹ $r = .53 \pm .05$ and $.70 \pm .03$ in the case of Latin and Geometry respectively.

sion that the tests measure the same thing. The lack of complete harmony justified their use as separate measures, and the differences may be important. But their inter-relationships must be borne in mind when interpreting their scores in the following chapters.

Prognostic tests of school achievement appeared to offer a readily accessible way of predicting school success in certain subjects, but unfortunately these examinations did not prove satisfactory when scores obtained were compared with the marks secured in these school subjects.

A further question now remains. The chief measuring rods employed have been compared with each other, and checked against school marks, and the latter have been accepted as the criteria by which the tests are judged. But is this justifiable? This problem is pursued in the following chapter.

Chapter 5

The Meaning of School Marks.

The "successful" school student obtains high marks; the "unsuccessful" one low marks. Every parent and teacher recognizes this. Yet little is known about these marks. As a matter of course, they are accepted as the final arbiter determining educational fitness. There is a great tendency also for marks to be considered independently. It is common to hear such remarks as: "I do well in geometry, but not in algebra", "Grammar is the one subject I never passed in", and so forth. To what extent do we find pupils doing well in one subject and not in others? This is a practical question with many implications. A child doing well in certain subjects and not in others may have difficulties typical of large numbers of students, or he may be an exception. In either case attention should be given to the source of the trouble.

How much importance should be attached to any one examination failure? Most parents must answer this question several times while their children are in school. Their answer may be based on many things, but not on concrete evidence as this is unavailable. Marks may vary from year to year or from examination to examination depending either on the teacher or the class a boy is in. They may be very stable and show little variation either from subject to subject or from year to year. Or these possibilities may be combined in a third. Perhaps considerable reliance may be placed on marks of certain subjects, little or none on those of others.

The meaning of school marks must be determined, because permission to commence a secondary school course and the progress registered in it are dependent directly upon pass marks. There are several reasons why these may vary from year to year.

(1) Examinations may not be reliable.¹ Numerous examples could be quoted to show that different teachers may mark the same paper and assign grades which vary from failure to high ratings. We would expect considerable variation from year to year in Montreal marks if this is the case. There is no province-wide standardized marking system. Not only are examinations different from year to year but the pupil would be at the mercy of the marking idiosyncrasies of the teacher.

(2) Marked changes in the attitudes and interests of students might result in variations even in reliable marks. This would mean that vocational guidance would have to include a wide-spread programme of psychological guidance in the non-intellectual social and emotional aspects of students' lives.

(3) There might be a decided consistency between marks in any one subject from year to year with little agreement between the various subjects themselves. Vocational guidance in high school would then require prognosis for each subject. The curricula in such a case should be such that students could be directed to particular subjects rather than courses which are rigid in their material.

These are possibilities: what is the actual situation? The answer is found in the application to school marks of the statistical tests similar to those developed to evaluate standardized tests. The exact amount of correspondence between Grade VIII school marks (June 1932) was determined for different subjects taught in Schools A and B. Many students were promoted and wrote Grade X examinations in June 1934.

¹ For a discussion of the objections to the usual school examination, see (a) Ruch, G.E. *The Objective New Type Examination* Chicago: Scott, Foresman and Co., 1929, Chapter III; (b) Hartog, Sir Philip and Rhodes, E.C. *An Examination of Examinations*. (International Institute Examinations Enquiry, Macmillan, London, 1935).

The relationships between these Grades X marks were measured. Since certain subjects in the commercial course at School C differed from matriculation subjects, an examination was made of their inter-relations.¹ This information not only disclosed the correspondence between marks in different subjects but showed the extent of agreement in marking between schools.

Another problem is that of the consistency of marks from year to year. This can be studied from an observation through a number of grades of the relationship between marks in any one subject. These observations were made for Schools A and B.²

By combining these data we can throw considerable light on the practical usefulness of school marks in predicting success in a particular school. The general significance of conclusions will determine this value to parents.

How consistent are the final marks upon which promotions are made? The average mark, which is the most important for promotional purposes, is internally consistent if the marks upon which it is based agree closely when the examination subjects are divided into two sets. For example, if there are ten subjects taught, these are divided into two groups of five and separate totals found for each. The coefficient of correlation between the two indicates the correspondence which actually exists between the two sets of subjects. A great many random chance factors would result in a low correlation which would be indicative of a lack of internal consistency. A high correlation, on the other hand, would mean that the marks are consistent and that whatever factors bias them affect all subjects in a similar manner.

This internal consistency was determined for four different groups of School A students: two in Grade VIII and two in Grade IX. Correlations which result are surprisingly high; sufficiently so in each instance to warrant the use of the average mark as an index of the general achievement of the pupil. We can, in fact, predict the success of the student in one half of his subjects from the average marks obtained on the other half. This would constitute an improvement of more than 50 per cent over a chance prediction.⁴

However, internal consistency does not ensure that marks give a valid measure of actual school achievement. But it does indicate that chance factors, which bias marks affect all pupils and subjects in the same general way. Pupils, in other words, who do well in four or five

¹ Tables presenting these coefficients of correlation are brought together in a Statistical Supplement, which can be obtained on application. See note in Introduction. The discussion in this chapter is based upon this material.

² Table 1, Statistical Supplement.

³ The following were computed (and corrected by the Spearman-Brown formula) for average Grade VIII and Grade IX marks of the Language and Science sections of Group A-1.

Grade	Group	Course	Number of Cases	r	Corrected
VIII	A-1	Language	68	.81	.89
		Science	63	.80	.89
IX	A-1	Language	99	.74	.85
		Science	87	.72	.83

⁴ The significance of these reliability coefficients can be observed from a few examples from the Grade VIII Science class:

1. Two boys secured total marks of below 257 on the first five subjects reported; each had marks below 260 on the remaining subjects.

2. Seven had marks totalling between 366 and 377 on the first five subjects; six of these had marks between 335 and 379 on the remaining subjects. The seventh boy had a mark of 417.

3. Two boys had marks above 426 on the first five examinations; both had marks above 410 on the remaining tests.

Similar examples could be given for the other groups. These will suffice however to indicate the close relationship which exists between one half of the school marks and the other half.

subjects, tend to do well in all; those who fail in four or five subjects tend to fail in all. Individual exceptions are few and comparatively slight; otherwise this high correspondence would not exist.

Next, how do specific subjects vary when compared one with another? It does not necessarily follow that because the average mark is consistent, marks in all subjects are equally reliant. To answer this question calculations had to be made on the basis of the marks in each subject. The answer cannot be based solely upon data secured in one school for different schools mark differently. School A, for example, promoted pupils annually; School B semi-annually. In School A one or two teachers marked all the June examination papers in any one subject; in School B each teacher marked his own papers. On many occasions, a "halo" effect in marking has been noted. (i.e., the marker scores a particular pupil's examinations either high or low according to his general opinion of the student). We may anticipate a closer agreement between a pupil's work in different subjects if one teacher marks all his papers. This condition may be expected to affect marks in School B to a greater extent than those in School A.

These differences in marking between Schools A and B, together with the differences in the pupils, increased the value of this comparative study. Greater differences did not exist in any two schools in the Montreal area, and any similarities in the consistency of marks between the two probably indicate true similarities.

The statistical agreement was determined between Grade VIII marks in the various subjects taught in Schools A and B. Fairly high agreement was found in some cases; low agreement in others. Certain differences were observed between the schools. The coefficients have been summarized below to show the percentage of the correlations of different magnitudes.

Table 3. Range of Coefficients of Correlation, Grade VIII Marks

Coefficient	School		Coefficient	School	
	A	B		A	B
.00 - .09	3.1	0.0	.40 - .49	18.4	38.2
.10 - .19	6.2	0.0	.50 - .59	21.5	14.5
.20 - .29	23.1	11.0	.60 - .69	4.6	7.3
.30 - .39	23.1	29.0			

Notable differences can be seen in the above table. A correlation coefficient of .30 has a predictive value of 4.61 per cent better than chance. This means that one mark is of no practical value in predicting another. A pupil who does well in one of these subjects may do well or poorly in the other. Those correlations of above .60 refer to subjects which have a predictive value of above 20 per cent. These though few in number indicate significantly high agreement. But 32.4 per cent of the coefficients from School A, and 11.0 per cent from School B were below .30.

The average coefficient of correlation was determined between each subject and all others as shown by school marks in Grade VIII. The range of these averages is small in School B, but quite considerable in School A. The coefficients are not large; therefore marks tend to vary in an independent manner. It is important to note that in both schools the showing in algebra and Latin agrees most closely with that in other subjects. The uniformity in the size of the coefficients referring to School B is seen more clearly in the table than in the figure which summarized the original coefficients.

It is evident that while the average mark has a great deal of self-consistency, there is no great tendency for marks in any one subject to agree with those in all others. Moreover, schools differ considerably in this respect.

Each mark enters into the average upon which promotion is made. The coefficients of correlation were therefore calculated between individual marks and the average for all marks. These are again considerably closer together in School B. The lowest is .60 (spelling) and the highest .75 (algebra). In School A four coefficients are as high as the latter figure (Latin, science, history, and algebra). There is, in particular, a correlation of .91 between Latin and the total for all subjects. This means that the prediction of the total mark likely to be received in School A from the Latin mark actually secured is 58 per cent better than chance.

This is very satisfactory in one respect. The course at this school differs from all others in the fact that matriculation students study Latin voluntarily. It is gratifying to know that those who can master Latin well are likely to do well in general. The course may truly be called a "Latin course". To a lesser extent, the same is true of the science course where the correlation is .81 between General Science and the average. (Prediction value of this science mark is 41 per cent better than chance). It may be added that this does not necessarily imply any special merit in Latin or General Science as subjects themselves. It means rather that the qualities which are necessary to learn them are likely to be closely correlated with other "learning" aptitudes.¹

A similar study was made of the marks obtained in Grade X by pupils who had been successful in Grades VIII and IX.² All students were registered in either a Latin or a Science course. The number of boys in each of the groups is small. Correlations tended to be higher in School B than in School A. This is brought out clearly in the following figures which indicate the percentage of correlation coefficients of different magnitudes.

Table 4. Range of Coefficients of Correlation, Grade X Marks

Coefficient	School		Coefficient	School	
	A	B		A	B
-.20 to -.11	1.4	0.0	.40 to .49	27.6	12.3
-.10 to -.01	1.4	0.0	.50 to .59	12.3	28.7
.00 to .09	9.6	0.0	.60 to .69	4.0	21.9
.10 to .19	8.2	1.4	.70 to .79	5.5	20.6
.20 to .29	12.3	1.4	.80 to .89	1.4	6.7
.30 to .39	16.4	5.4	.90 to .99	0.0	1.4

Again a third of the correlations between marks in School A are below .30. The situation is different at the upper end of the scale. Only 6.9 per cent of the coefficients from School A are above .70 while 28.7 per cent of those from School B were of this size. There was in general, a greater range in agreement than occurred at the Grade VIII level.

The average agreement between each subject and all others when measured, showed that School A correlations were consistently lower than those in School B. The parent whose son is at School B is much better able to determine his general standing in any subject from one particular mark than is the parent of the School A student. In neither school, however, are the correlations between one subject and other individual subjects particularly high. We cannot conclude that marks in a given subject can be predicted from those in another.

¹ Agreement between Latin and average marks was not as high in School B. This may be due to the fact that Latin is compulsory for matriculation students. Many who are totally uninterested in this subject may be studying it necessarily for two years.

² That is, the examination of marks was restricted to those of boys successful in school. Had all Grade X records been examined, results secured might have been different.

Brief reference may be made to the inter-relations of marks in commercial subjects. These correlations were determined for Grade VIII and IX marks of a small group of 40 students in School C who completed both grades. In most instances the agreements were low. The correlations between each of the Grade VIII commercial subjects and the average for all subjects were lower than the comparable correlations in Schools A and B. However, both shorthand and bookkeeping in Grade IX had correlations of over .80 with the average for all subjects. These primarily commercial subjects apparently have a good indicative value. But pupils may have a good record in Grade VIII and still do comparatively poorly in the commercial courses. Those who succeed in the latter during the ninth grade, however, are the students with good general records.

One further question now requires consideration. What is the relation between marks obtained by a student in a particular subject as he goes from grade to grade? Under one denomination, for example, pupils study history (British, Canadian and Ancient) in Grades VIII, IX and X respectively. What relationship is there between the marks in these subjects? A series of correlations were ascertained for (a) marks in Grades VIII and X, of pupils who commenced Grade VIII classes in Schools A and B in September 1931 and completed Grade X in June 1934 between Grade VIII and IX, (b) Grade VIII and IX, and (c) Grade IX and X marks. Some very interesting results are thus brought to light.

1. There is a significant correspondence between Grade VIII and IX marks, in all subjects except composition (in School A) and spelling (in School B). Grade IX marks in French can be predicted successfully on the basis of those secured in Grade VIII. The other relationships are definitely significant although somewhat lower. This indicates that there are no marked differences in the qualities demanded of the student likely to be successful in the two grades.

2. The agreement between marks in Grades IX and X is not so consistently high. French marks can again be predicted with fair accuracy on the basis of those secured in Grade IX. This is also true (in School B) of Latin grammar and drawing; and of Latin composition, physics and chemistry (predicted from general science) in School A.

3. Considering the two-year interval between Grade VIII and Grade X, there is a remarkable correspondence between these marks. This is most outstanding for French, in which the prediction-value of Grade VIII marks remains at 40 per cent better than chance. It is less for the remaining subjects. In School A, Grade VIII marks in drawing, composition and algebra all reveal little value in predicting Grade X marks. The others show high prognostic values. In School B all the Grade VIII marks have definite value in predicting those likely to be obtained in Grade X.

4. No reference has yet been made to the very high correlation which appears to exist between average marks in these three years. This correspondence was higher than would have been expected from two equivalent forms of a standardized test which was given to classes over this period. Only two of the ten correlations between average marks were below .74; six of the ten were .80 or higher.

These close relationships between marks from year to year may appeal to an orderly mind; but they are in fact disturbing to a mind concerned with the welfare of the boys and girls attending our high schools. The correlations seem to be high. Yet they are to a large extent spurious because only successful pupils' marks were incorporated in the study. We have disclosed a very strong tendency in both schools for successful Grade VIII students. But what of the others who fail? The agreement would be even higher if account had been taken of these.

The situation might be satisfactory if there were sufficiently

broad curriculum options for all to choose. But if the courses are too rigid the selective process may be too severe. In the chapters which follow we will trace the record of the pupils who enter the various courses of study, and compare their progress. In doing this it must be borne constantly in mind that the matriculation courses have a rigid structure. A general conclusion as to "school success" and school efficiency cannot be drawn without a good deal of additional material. When they enter high school pupils tend to be caught in a machine. They may do better in some subjects rather than others but the odds are against their success.

Several practical questions were raised in the early part of this chapter, which have so far been answered in statistical terms. But they can also be put in non-statistical form.

How much importance should be attached by a parent to any one school failure? The answer is clearly a great deal. The majority of Grade VIII marks are definitely significant of future progress in that subject. The pupil who fails in a given subject in Grade VIII is likely to fail in that during successive years even if he obtains over-all marks which are sufficient to pass the grade.

To what extent do we find pupils doing well in one subject and not in others? There is only a slight tendency to uniformity between subjects, and this is greater in schools where one teacher marks all papers. But, in general, a pupil may be weak in one or two subjects and average or superior in the others. As final marks in particular subjects are consistent from year to year, strong or weak tendencies will probably continue to manifest themselves.

How consistent are the final average marks upon which promotions are usually based? So far as the samples are concerned on which the judgment is based, they are very reliable. Their internal consistency is as great as that of standardized tests. Furthermore the average marks have very high predictive value from year to year.

To what extent can these conclusions reached from the data of one school or curriculum be extended to others? Unfortunately, generalizations have to be made with care. There are large differences in the significance of marks from school to school. On the other hand the rigidity of the curriculum is a factor which consistently linked School A to School B.

What type of guidance should be most beneficial in view of the relations existing between marks? The answer to this presupposes the condition that there will be no changes in subject matter or in the rigidity of marking. Granting this condition we may say that guidance should be related to particular subjects. Pupils should be able to select particular subjects in which they stand a chance of success, or - what is more to the point - to which they are most adapted. This presupposes an acquaintance with these subjects which in turn suggests the necessity of a junior high school. It also points the need for as wide a group of available subjects as possible. School subjects will always remain a strong influence on the young adolescent. As long as success in certain subjects and hence grade-promotion continues to be too mechanical in principle, it seems profitless to suggest guidance in the "non-intellectual phases" of life. But it is important, in and out of school, and unless changes are made such guidance may be the only way to overcome curriculum rigidity.

Part II
WHO GOES TO HIGH SCHOOL?

Chapter 6

Characteristics of the High School Groups Examined.

The techniques and methods used in this study have now been described, and later chapters will analyze the data collected. The next question is to ask what similarities and differences there are between the twelve groups of adolescents. The following pages give a brief classification of the sample groups, with emphasis placed upon certain non-psychological characteristics: the school grade attained by the boys; their ages; languages spoken at home; and the occupations of their fathers.¹

Eight of the twelve groups, with a total of 1458 pupils, were students in Grade VIII. An additional 993 students represented the Grade VII group. The 73 high school graduates had completed Grade XI. Each of these samples was homogeneous in respect to education; two others were not.

One heterogeneous group was composed of unemployed boys. Among these, some had had eleven years of schooling while others had only four. Sixty-four per cent had not entered high school. Yet these boys had a higher standard of education than the larger group from which they were drawn. The significance of this is clear: a study of vocational guidance in relation to high school students refers to a restricted part of the total youth population in Montreal. This difference in educational status between boys still at school and unemployed boys lessens the indicative value of the latter group. These youths had been out of school for an average of only two years so the difference in schooling cannot be accounted for by a general trend toward higher education. The group is different from all the others and comparisons must be made with caution between it and the groups still at school.

The other heterogeneous group was secured in a city outside Montreal. One hundred and twenty-six students were attending classes from Grades VI to XII and another 65 were divided between five grades of a technical school course. Consequently the number was too small at each grade interval to permit satisfactory comparisons of pupils from grade to grade. Further, the range in educational achievement was so great that few comparisons could be made between the total group and students examined in Montreal.

Among boys attending school, age is closely related to grade-status. From 65 to 85 per cent (depending upon the group) of boys examined in Grade VIII were either 13 or 14 years old. There was a sharp break in the age distribution at this lower level. Only the occasional student of twelve years appears. Above the age of 14 there is a gradual tapering off in the number of boys. A similar situation prevails among the Grade VII pupils; 62.5 per cent of boys and 68.2 per cent of girls were either 12 or 13 years old. One difference can be noted between the sexes. Boys in School B tended to be younger than girls; girls in School C and in the Grade VII were slightly younger than boys.

A rough allowance can be made for age differences between high school graduates and Grade VIII students: the former must have three and a half more years of schooling. When this allowance is made, the age distributions appear similar as the majority of students are sixteen or seventeen.

These Montreal groups are not altogether homogeneous in respect to age. While the range is only four years in certain matriculation

¹ The statistical data upon which this chapter is based is presented in Appendix, Tables I-VII.

groups, in School B, it is six years in School A and seven years in School C and in the group of Grade VII classes. This diversity implies a wide variation in physical and mental maturation within any one grade. This may be very significant in respect to teaching methods, but it may be neglected when comparisons are made on the basis of psychological test scores, as it is similar for all groups.

A wide range in the ages of unemployed boys was to be expected. These lads were definitely older than those in the other groups. Thirty per cent were from 18 to 20 years of age as compared with 5.4 per cent thirteen or fourteen years old. Educationally this group was inferior to the Grade VII students, yet a considerable percentage of its members were older than the high school graduates. This is further evidence that its data should be segregated.

The group examined outside Montreal shows a very great range in ages. The total age range is meaningless, owing to the manner in which it was recruited. But, grade for grade the distribution is similar to that in Montreal.

These age and grade differences between groups necessitated the use of different psychological and educational tests. Otherwise certain students would have been under a distinct handicap. Another possible handicap had to be considered: a language difficulty. Pupils speaking a foreign tongue at home might have difficulty with certain of the tests. This problem is examined carefully in a later chapter. Here it is sufficient to indicate the nationality background of students with a view to differentiating groups.

The majority of examinees spoke English only. Groups recruited in School B must be differentiated from others in this respect; most of the pupils here were Jewish, and no psychological tests were administered to them. Only in the group examined outside Montreal is the percentage of French speaking boys greater than 4 per cent. Thirty-five per cent of these youths were in a Technical course where almost every student was French. Hebrew was the only other language spoken by any appreciable number of students. Consequently a classification of languages was made under the three headings: "English only", "Jewish" and "other languages".

Certain differences were observed in the language background of the groups.¹ Only two to three per cent of School A students spoke Jewish as opposed to somewhat higher figures from School C. Twenty-nine per cent of Grade VII students spoke this language as did 23 per cent of the high school graduates. The prevalence of other languages was about the same in all groups except the latter: ten to eleven per cent of each group spoke foreign languages other than Jewish; only one of the 73 high school graduates was foreign speaking. The unemployed boys were almost all English speaking; this was a deliberate result of the method of their selection.

The figures given do not apply generally to Montreal schools. They are due in part to the particular schools selected. An investigation based on other institutions would undoubtedly show a different nationality background. The figures deserve consideration because success on many of the tests demands an adequate knowledge of English. The groups are sufficiently homogeneous so far as the non-Jewish foreign element is concerned to permit any necessary comparisons. Any language handicap may be expected to be similar in all groups; hence it will cancel out. Additional attention must be given the problem of Jewish students, for here the proportions are unequal.

The distribution of parents' occupations also is dependent upon neighbourhoods. Parents of pupils attending certain schools may tend to be skilled and semi-skilled workers, clerical workers may be repre-

¹ Data are based on information secured from a questionnaire item enquiring as to languages spoken.

sented in others, while certain institutions may have large percentages of students with fathers in administrative and professional positions. Data concerning occupations of parents were available for five groups. Three of these were in school. Schools A and C drew pupils from the same general areas. They registered in the former for a matriculation course; in the latter for a commercial one. The occupational differences are slight except at the extremes. None of the commercial students had parents in the higher professional and administrative fields while 18 per cent had fathers in unskilled repetition work. Comparable percentages from School A were 8 and 6. Comparisons cannot be made between these boys and the Grade VII pupils as there is not sufficient overlapping in areas covered by the two groups.

The unemployed and high school graduate groups were drawn from all parts of Greater Montreal. Therefore comparisons can be made between them. The differences are striking. There were no unemployed boys whose fathers' occupations ranked in Burt's two top categories where we find 55 per cent of the other. There were no high school graduates whose fathers ranked below skilled work where 44 per cent of the occupations of the former were placed. Chance factors in our selection may have exaggerated these differences. They are so marked, however, that our evidence supports the statement that the average person works in the same occupational category as his father.

Chapter 7

Potential High School Students: A Grade VII Sample.

All high school students have successfully completed the elementary grades. The first choice of curriculum is made by the boy or girl after the Grade VII examinations have been passed. We have observed the very close relationship between success in Grade VIII and the higher years. Presumably the conditions which lead one pupil to be successful and another to be a failure will exist before as well as after they enter the secondary school. Some conditions which may affect promotion can be examined more readily before students have been segregated into different optional courses of study. Recognition of this led to an examination of a group of just under one thousand Grade VII students - 993 in all, from eleven schools.

Boys who graduated from these tended predominantly to enter Schools A, B, or C.¹ This provides one control to any observations made, but not a sufficient one if we wish to generalize conclusions. Preferably the same study should have been carried out with two different groups, since it is possible that students in a given grade in one year, may differ in important respects from those in the same grade another year. One natural division among the 993 Grade VII students, however, provided an adequate control. About half the group wrote their Grade VII examinations three months after taking the tests of the present study; the other half eight months after. The one group were due to enter secondary school in September 1933, the other in January 1934. Comparisons were made between these two halves of the tested Grade VII group, and it was evident that there were no discrepancies not accountable by the half-year difference in educational status.² Factual evidence obtained from pupils graduating in June may thus be taken as typical of that secured from another graduating class. Also there were no observed differences between the pupils examined and the other Grade VII students in Montreal.

The natural division of tested Grade VII students into two half-year classes is recognized in the treatment of data. Material presented in the following pages refers only to those pupils who would graduate in June. Two major questions can best be discussed in reference to these : What conditions are associated with elementary school success? What are the conditions associated with high Grade VII marks? The two questions will be treated separately although they have a good deal in common.

Some General Differentiating Conditions.

Some students benefit more from their studies than others. There are many reasons for this - mental retardation, sickness necessitating absence, a mobile family which requires the children to change from school to school, faulty habits in reading, arithmetic and other fundamentals of school work, antipathy toward school due to attitudes fostered by parents or teachers, etc. The list could be extended indefinitely, but our interest is restricted to a few. What are the effects upon school work of age, various "skills" shown by psychological tests, knowledge of kinds of higher education available, languages spoken at home, and attitudes toward high school.³ These factors have had an opportunity to manifest themselves by the time a pupil reaches the seventh grade.

For a simple division of the successful from the unsuccessful

¹ See Note at end of chapter (p.48).

² See tables in Statistical Supplement.

³ Details of these measurements are given in the Statistical Supplement to this book.

students at Grade VII, age probably provides the best criterion. The reasonably successful pupil is promoted from grade to grade annually. More accelerated promotion is unusual in Montreal, though it is common in many other educational systems. From a purely statistical viewpoint this aids interpretation. It is fairly certain that pupils retarded two or more years benefit little from their attendance at school. The student who is retarded only one year may have missed much work through illnesses, a change in school, or other valid reasons; and there is also a certain amount of normal variation in the age of commencing school. But, in general, children entering Grade I at six years of age should finish Grade VII at twelve, or at the most thirteen years of age. If the pupil is older than this, some defects in capacity may be looked for. If fourteen is accepted as the age which differentiates successful from unsuccessful students thirty-two per cent of the total group finishing Grade VII come within the latter category.

Do boys or girls make a better adjustment to the school environment? Both are given the same education irrespective of any differences in psychological needs. It is a finding of much interest in itself that girls in Grade VII tend to be younger than boys:

Ages of Grade VII Pupils
(247 boys and 279 girls)

Age	11	12	13	14	15	16	17 Total
Boys	1	30	29	20	14	6	0 100
Girls	2	33	38	19	4	3	1 100

Forty per cent of the boys are fourteen years of age or more as opposed to 27 per cent of the girls. That is, thirteen per cent more boys are retarded than girls. This should be borne in mind in the ensuing study of high school success which is concerned principally with boys. If they are retarded more frequently than girls, we may expect to observe a larger percentage of failures in this investigation than would be found in a mixed group.

Between different language groups statistically valid comparisons cannot be made because of the small number of pupils who speak languages other than English. Jewish (Yiddish) was spoken by 133 pupils, and 74 boys and girls spoke other foreign languages. The division throws an interesting side-light upon the age distributions, however. When these data are tabulated with the pupils divided in two groups, "probably retarded" and "probably not retarded", 43 per cent of the English-speaking boys appear in the former class (14 years or over) as compared with 29 per cent of Jewish-speaking and 47 per cent of those using other languages. Somewhat lower percentages, 29, 18 and 30 respectively, were observed for the girls. These figures must be conceded a large margin of error, though they are consistent for the two sexes. On the whole, Jewish pupils tend to be younger than non-Jewish ones, and the figures do not indicate for bilingual children more than a slight language handicap. On this limited evidence at least, it does not adversely affect their school promotion.

Conclusive evidence on the attitudes of children toward school is difficult to secure, but the child's desire for further study is an important clue. The Grade VII pupil is probably uninterested in school if he has no notion of the secondary school courses from which he must choose in three months time, or if he does not know which course he would like to follow. Statements made by pupils should not be accepted literally. But an indication of general attitude may be secured without paying detailed attention to courses actually followed.¹

¹ The secondary school careers of 77 Grade VII boys were followed up for one year. Forty-two of these entered courses at variance with their previous statements.

Highly significant differences were found in attitudes exhibited toward matriculation courses. Only 8 per cent of English speaking boys and 4 per cent of these girls desired this. Forty-two per cent of the Jewish boys and 26 per cent of these girls wanted a high school curriculum leading to matriculation. The comparable figures for pupils speaking other languages are 16 and 17 per cent.

Apparently, no course of study is particularly popular with English speaking students. Jewish boys, however, showed a distinct preference for the matriculation course while girls speaking this language gave first preference to commercial training (53 per cent). Uncertainty as to whether high school would be attended, also, was least prevalent among Jewish pupils. Only 18 per cent of these boys and 8 per cent of the girls considered it doubtful whether they would take further courses. When these ambitions are considered in conjunction with the age distributions, Jewish pupils (who are somewhat younger) are the most homogeneous in respect to educational ambitions and the most decided in striving for the highest goal.

These data indicated a serious guidance problem. Only 42.5 per cent of the boys and 44.8 per cent of the girls had any idea of the high school course they would enter. Yet 81.9 per cent of the graduates from the 11 schools studied entered high school in September 1933. Changes in wishes and choices may occur between March and September, but it was clear that a large percentage of Grade VII students had not given serious thought to their high school courses, or were not in possession of proper information about them or their alternative, or both. What then was their incentive to study in Grade VII? They were studying blindly, doing the work prescribed for them with no thought of its consequences, and without direction to a particular goal. Do school difficulties develop this purposelessness? Or does working without a clear goal result in poor work? It may be suggested that "high school" as the "next stage" can be taken for granted. But so vague an acceptance of the school system, if it really existed would be almost a criticism in itself. All studies of learning processes emphasize the need for an incentive, and it is difficult to understand what incentive these children have.

Mental Abilities.

What scores do Grade VII pupils obtain on psychological tests? Four examinations were given these boys and girls. Two were tests of intelligence, which differed in that one required the pupil to use words and display verbal ability, while the other (part of Revised Beta) did not require a knowledge of English. These tests do not agree closely with each other and each must be referred to by name. The third was the Haggerty Reading Examination, scores on which agree very closely with those from the Army Alpha Revised Examination. The fourth test was a part of the Revised Beta Examination: Test 4. This consisted of problems in form relations and may be accepted as one measure of mechanical ability.

Psychological abilities are known to increase with age through childhood. This growth has usually not ceased at the time the pupils are in seventh grade, and among an average group of children it might be expected that the older ones would receive higher scores than the younger ones. Actually this did not prove to be the case. There was a definite tendency for test scores to vary inversely with the age of the students. Test scores were also differentiated according to age, sex and family-language group. The younger pupils in all three language categories tended to obtain scores higher than the older ones.

Matched age for age, Jewish-speaking boys and girls made lower scores than English speaking pupils. This applies to all four tests although a few exceptions can be noted. Students of native language-groups other than English or Jewish also show lower scores than English boys and girls. Notably, Test 4 of Revised Beta is the only exception in which the non-English, non-Jewish students secured the highest scores.

In general and taken age for age, English-speaking boys and girls secure higher marks on psychological tests than "foreign" pupils but they tend to show a greater percentage of retardation. Also they have less incentive in the way of educational ambition. Does this explain the discrepancy between actual school success actually achieved and that which might be expected from the test results? This question cannot be answered absolutely but lack of informed incentive is certainly one cause among others, of the educational difficulties of English-speaking pupils.

School marks secured at the crucial point (Grade VII, June 1933 in this case) supply one further clue to general success in elementary school. The pupil with a poor foundation in school work may be expected to obtain low school marks. A study of these in relation to age indicates that the younger pupils obtain higher marks than the older ones. But school marks are not distributed in the same manner as psychological test scores. Jewish pupils are superior to others when matched age for age - further evidence that these students are not under a language handicap which interferes with school work. Accepting occupations as a criterion of social background, intelligence test scores tend to vary with the occupational status of the parents of children examined. It was possible that English speaking children came from homes higher on the occupational scale than pupils from "foreign" groups. This, however, was not obviously the case. When matched for the pupils by age-groups, no differences can be noted in the occupations of fathers of pupils in the three language categories.

School Marks and Other Factors.

In the preceding section the influence of certain background facts have been related to test score differences. It is worth while also to relate them to differences in school marks obtained at the Grade VII examinations, which decide promotion.

The average mark obtained by 500 Grade VII students was 71.9. The marks obtained by students when classified according to the languages spoken were as follows: English only 71.3; Jewish 73.2; and other racial groups, 73.3. Average marks, however, give a very limited picture. Some account must be taken of the dispersion of marks above and below the average. This comparison was facilitated by arranging the marks of the 500 pupils in rank order from lowest to highest, grouping them in deciles,¹ and calculating the percentage of pupils in each of the three language divisions for each decile.

Of the students as a whole, twenty per cent (ranked in either the first or second decile) failed, as they secured average marks of below 65 per cent.² Only thirteen per cent of the Jewish boys and girls failed as opposed to 22 per cent of pupils in each of the other language categories. At the top of the class, also 38 per cent of Jewish students had marks above 76 whereas only 26 per cent of the English students and 29 per cent of the other language group secured averages this high.

All the evidence supports the conclusion that, among those pupils attending school, there is no language handicap affecting school marks at the Grade VII level. Students from alien racial backgrounds may have serious difficulties in some respects, but these do not cause their school marks to be notably lowered. No further differentiation will therefore be made throughout the remainder of this study between pupils on the basis of native language.

Compared with the ages of students, the distribution of school marks shows some close relationships. The pupils were divided into two groups according as their marks were above or below the average of the

¹ i.e., the lowest 10 per cent of students are placed in the first decile, next lowest 10 per cent in the second, etc., so that the best ten per cent of marks form the tenth decile.

² Unconditional promotion requires that a pupil secure an average of 65 per cent on all subjects or secure above 60 per cent in every subject.

500 students. The following figures show the cumulative percentages of pupils whose school marks were in the lower half:

Age	P.C.
17 years or younger	100
16 "	83
15 "	82
14 "	66
13 "	48
12 "	30
11 years	25

If age were not indicative of a selection among pupils, approximately 50 per cent of pupils at each age level would be found in the lower half of the class. Clearly this is not the case. The figures above signify that the younger pupils are better prepared for their examinations than the older ones. This justifies the use of age as the criterion by which retardation was judged in the preceding section.

A large proportion of Grade VII students have little knowledge of secondary school courses, and it has been suggested that this lack of knowledge may produce a low incentive to work. Do pupils who succeed on Grade VII examinations have greater incentive (i.e., ambition) than those who fail? Tabulation of high school interests in relation to school marks provide some answer to this question.

The desire to study Latin in high school is evidently related to Grade VII school marks. Twenty-eight per cent of pupils in the top 10 per cent of the class want to study Latin as opposed to 8 per cent of the poorest tenth of the group. Another difference can be noted between the good and poor students. The hundred poorest students failed; they included 55 without specific high school ambitions. The hundred best students all had average marks above the general average of 76.2; but only 39 were without academic ambitions.

No further tendencies toward agreement between the courses of study desired and the Grade VII marks obtained could be noted, however. The figures given above are significant in view of the importance of Grade VII marks in predicting high school success. As will be made evident later, the pupil failing in Grade VII has little chance of succeeding in high school. Yet 45 per cent of the failures desire to commence high school, and 22 per cent desire studies leading to matriculation.

A large percentage of students do not desire high school courses while another large percentage want courses for which they are clearly not suited. This, more clearly than any other single type of data, shows the need for guidance of pupils before they enter high school.

There is no relationship between school success as measured by Grade VII marks and social class as indicated by the occupations of fathers. This social factor appears to be of minor importance in determining school attainment. Pupils with fathers in low paid jobs are just as likely to stand near the top of their classes as those whose fathers are higher in the occupational strata. Yet many of the former may be forced out of school owing to the inability to pay school fees, car-fare, books, etc. We have seen that pupils who graduate from high school (a minimum of four years after Grade VII) have parents in positions which are financially favourable. In the secondary school grades, economic factors segregating students are more apparently at work. These force many good students out of school and place barriers in the way of others which may cause failure before the completion of high school.

Finally, how are psychological test scores themselves associated with Grade VII marks? Much of the material in later chapters will deal with these scores, but something needs to be known of the extent of agreement between them and school marks at the period before pupils are segregated into different courses of study.

There is little agreement between the measurements of intelligence given by Army Alpha Revised and Revised Beta Examinations. But data from both agree in showing that the top 10 per cent of students are of superior mental ability. This is significant as it demonstrates that the tests are not simply measuring school learning.

The range of scores on the Army Alpha is wide, and deserves attention. There are some individuals in eight of the decile groups who score above the average of those in the tenth decile, and below the average for those in the first. The tenth and the first deciles are the exceptions. No individual who obtained a school mark of below 61.5 had an Army Alpha Revised score of above 112.9. No pupil with a school mark of above 84.1 scored less than 66.7 on this intelligence test. There was somewhat more overlapping on the Revised Beta Examination which is inadequate for use in one grade. In average Army Alpha scores, as school marks decrease there is an irregular decrease. The middle 40 per cent of students, i.e., those with school marks between 67.0 and 76.1, are in no way differentiated by scores on this intelligence test. But differentiation does appear above and below these limits.

The true relationship between intelligence test scores and school marks is presumably even closer than indicated above. Age affects test scores; younger pupils are handicapped by their age, as older ones are more mature mentally. Yet older students tend to secure lower marks than the younger ones. Thus if account were taken of age, the difference would be greater between intelligence test scores and school marks. The use of the I.Q. in preference to intelligence test scores would in part rectify this difficulty.

The Haggerty Reading Test scores vary closely with marks on the Army Alpha Revised. Consequently similar distribution of scores on the two should be expected, and this was the case. Reading test scores differentiated pupils in the same way and to about the same extent as did Army Alpha Revised scores.

It may be concluded that a definite relationship exists between a good showing on intelligence tests and in school work. The apparent effect is a weeding-out of those pupils who are comparatively weak in basic intellectual ability. Those who are comparatively superior tend to obtain high school marks. But many pupils fail who are of superior intelligence, others pass who are comparatively low in this ability. We must recognize in this the operation of non-intellectual factors which often determine school success.

Is manual training indicated as the simple alternative for those failing in the present high school entrance examinations? Mechanical ability, of course need not be closely related to either school marks or scores on intelligence tests. Revised Beta Examination Test 4 was shown to be sufficiently reliable to permit group comparisons of mechanical ability. But no relationship appeared between scores on this test and school marks. In other words mechanical ability, as measured by this test, may be present or absent in a pupil whose academic work is poor. Technical school classes, then, are not necessarily the educational solution for all pupils unable to succeed in the academic courses. Further diagnostic work would seem to be necessary. This conclusion is open to some doubt, as only one aspect of mechanical ability is measured by the paper form-board test. But this criticism is offset by the fact that this particular test of mechanical ability is not dependent upon acquired knowledge of machines and tools. Environmental pressures may force the poor pupil to develop apparent interests in mechanical objects; these interests may be superficial and

may not be expressions of ability. However both types of mechanical ability tests need to be included in a specific survey before a final conclusion is drawn on this topic. The evidence here presented needs to be substantiated by broader tests. Tentatively, however, it should certainly not be assumed that the ability to succeed in technical training classes is related at all closely to that required to secure high marks at the final grade of elementary school.

Note on Group D (Grade VII pupils)

The perspective of this Grade VII group can be gathered from the following figures (from the annual reports of the Protestant Board of School Commissioners, City of Montreal, 1931-32 and 1932-33). These figures do not indicate the exact number of pupils in Grade VII when this investigation was undertaken. The group tested was selected in March 1933. Many schools had semi-annual promotions, and in these there may have been a considerable exchange in the numbers in each grade between September 1932 and March 1933.

1. In the 33 schools with Grade VII classes, 2932 pupils were enrolled in September 1932. Of these 887, or 30 per cent, attended the eleven schools from which the sample (Group D) was taken. The pupils who wrote Grade VII examinations in June numbered 1850; of these 590, or 32 per cent, were in Group D.
2. From Group D, 85.2 per cent (503 individuals) were promoted as compared with 88.9 per cent of those in the remaining 22 schools.
3. 80.4 per cent of the graduates from the 22 schools entered secondary school in September 1933 as compared with 81.9 per cent (412 students) from the 11 schools studied.
4. 103 of these 412 students attended a high school for girls which did not come within the scope of this study.
5. Only 12 of the remaining 309 students entered secondary schools other than A, B, and C.
6. Of the total Grade VIII enrollment of Schools A, B, and C, in September 1933, 39 per cent were graduates of the 11 elementary schools comprising Group D.

Chapter 8

Are There Differences Between the Students Who Choose Different Courses?

(a) Test Ratings

The importance of the choice of courses of study has been made clear in previous pages; and it is also reasonable to expect some significant differences between the pupils who make the various choices. How far do they tend to be differentiated in terms of intelligence and capacity? With this question in mind, psychological and educational tests were administered at the beginning of the study to Grade VIII pupils in Schools A and C. Certain additional tests were given the same pupils in Grade IX the following year.

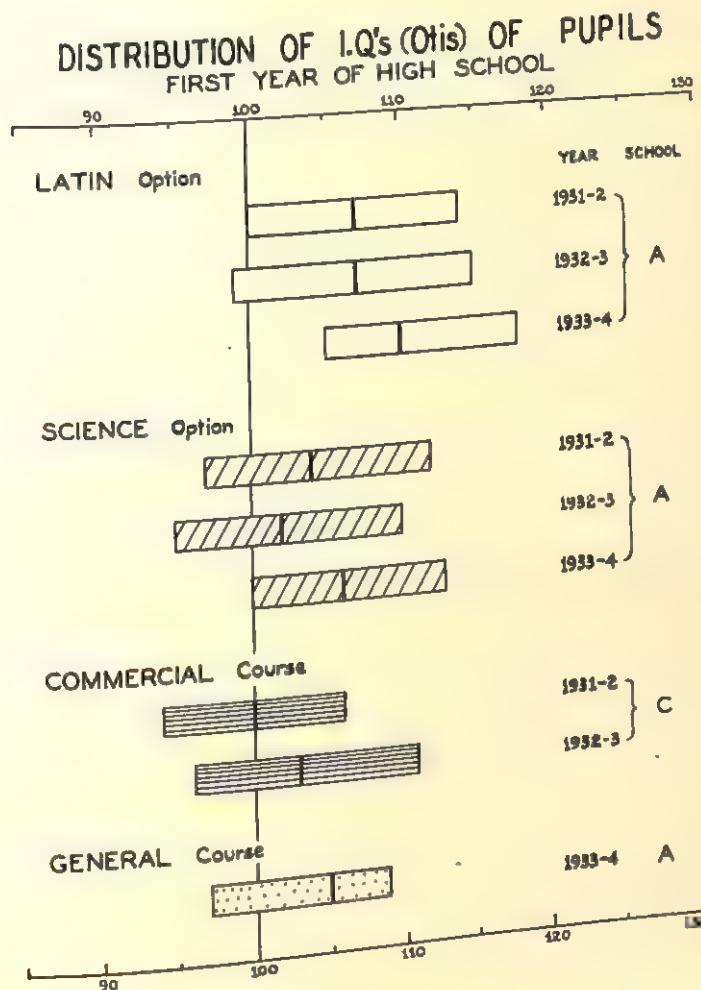


Fig. 1. Distribution of Otis I.Q.'s of high school boys at Grade VIII, groups classified by courses. Interquartile range (middle 50 per cent).

Measurements of this type should be of considerable aid in the evaluation of the various examinations as tools in vocational guidance. The first matter to examine is how the test scores are distributed among pupils who selected particular courses of study. There are three reasons for studying this distribution:

(1) The tests may be too easy or too difficult for the majority of pupils. Either situation would seriously limit the reliance that could be placed upon the scores.

(2) Any differences in the initial composition of groups of pupils who have chosen different courses of study will be disclosed by marked differences in their intelligence and achievement ratings.

(3) The value of psychological tests in educational guidance will be established if it is shown that pupils obtaining high scores on these tests have better school records than those obtaining low ones. The determination of the average scores of all pupils following different courses of study, however, is the first step in such an evaluation. This third point can be established only when the first and second have been evaluated.

The comparison of one group with another in respect of its average prepares the way for the evaluation of these tests as instruments of guidance; it also shows the range of variation existing in the abilities and achievements of Grade VIII students.

Three courses of study were offered to pupils graduating from elementary schools in Montreal at the date of this study (in June 1931). They could enter School B or C and take a Commercial course; they could attend School A and here either include Latin in the first year of the course (leading to B.A. matriculation), or take General Science as an alternative (leading to B.Sc. matriculation). The former course is referred to as the Arts or Latin course, the latter as the Science Course. A new alternative course was introduced in Grade VIII of School A in 1933. This was a general cultural course which led to the High School Leaving Certificate. It will be referred to as the General Course.

Ratings on Intelligence Tests.

The Otis Self-Administering Tests of Mental Ability were administered (in December 1931 and January 1932) to Grade VIII pupils in Schools A and C. The same tests were also given to all pupils entering Grade VIII in these two schools in September 1932, to those entering School A in September 1933, and to a group of unemployed boys.¹

¹Comparisons between the school group and the unemployed boys examined indicate clearly that the latter group is inferior, and this information confirms earlier comparisons. Because of the great divergence, few further comparisons are made between Grade VIII students and unemployed boys, but the difference is of much interest in itself.

	Group	Beta Test	Otis I.Q.
No. of cases	Unemployed At School	182	180
	Unemployed At School	206	789
Mean	Unemployed At School	81.2	87.2
	Unemployed At School	85.6	104.0
Standard Deviation	Unemployed At School	16.2	13.5
	Unemployed At School	11.8	10.7
Difference (a) (b)		4.5 100	22.3 100

(a) Ratio of the difference between the two means to its probable error.
 (b) Number of chances in 100 of a true difference greater than zero being represented.

The average variation in intelligence quotients (I.Q.) between pupils who entered each of the alternative courses is shown in Fig. 1.¹ In addition to showing the variation in average I.Q.'s the chart indicates, for each group, the I.Q.'s which mark off the poorest and the best 25 per cent. The number in each group varied from 103 to 170. There is one exception to this: only 28 boys entered the general cultural course of School A (in September 1933). Only limited significance can be attached to the average for pupils in this general group, but the other groups are comparable.

Certain differences of considerable magnitude appear. Average I.Q.'s vary from 100 (Commercial Course pupils in 1931) to 110 (Latin students 1933). The average I.Q.'s for pupils choosing the B.A. matriculation option are higher than those in any of the other courses.² Some of these differences are statistically significant, some are not. But "Latin" pupils are definitely superior on the average to those taking other courses.

The differences in average I.Q. between pupils in the Science and Commercial Courses are not as great as are those between the Arts and Commercial groups. Statistically they are significant one year and not the other. There is, however, a real difference in I.Q. shown between Arts and Commercial students.

The Otis test was given (in 1932) both to boys and girls in School C. It is interesting to find that the difference in average I.Q. between these two groups did not indicate that the calibre of the pupils is widely separated. Furthermore the range of intelligence was similar when the boys were compared with girls.

As between groups, the tests revealed marked differences in the distribution of intelligence. While the difference in the average intelligence of pupils commencing the Arts and the General Course of School A in 1933 is only five points, more than 75 per cent of the boys taking the General course are less intelligent than the average student taking the "preferred" Latin course. Moreover, 75 per cent of the boys and girls who entered the Commercial course in 1932 rated lower in intelligence than the average pupil who commenced the study of Latin in School A in 1933. More than 75 per cent of the boys who commenced the Commercial Course in 1931 had I.Q.'s below the average for School A Language Course students in 1931, 1932 or 1933.

Percentages, of course, may easily give false impressions. It must not be assumed that every individual in the Commercial and Science groups is inferior to every Arts student: still less that the mere registering for an Arts course will insure high intelligence. To take the 1932 Grade VIII classes as an example, the following situations existed:

(1) While 33 Arts boys have I.Q.'s above 120, there are 7 such boys in the "inferior" Science group and 7 boys and 4 girls in the Commercial class with similarly high intelligence.

(2) While 12 Science and 10 Commercial pupils have I.Q.'s below 90, this is also true for 10 of the "superior" Arts students.

Similar figures could be presented for each of the other classes. Nothing can be assumed concerning the intellectual ability of a pupil merely because he registers in one rather than another course. The tendency is for those in certain courses to be inferior; for those in others to be superior. This tendency may be very marked, or it may be slight, but in neither case can we conclude that a particular boy is dull or bright because he has entered one rather than another course.

¹ Prepared from Table VIII, Appendix of p. 49.

² Table X.

These tendencies which have been revealed indicate pretty definitely that there is a more or less unconscious selection of high school course on the basis of the child's "general intelligence" or learning capacity. One cannot say simply that this is because Latin appeals to the more intelligent student. In many cases teachers and parents assign a higher value to Latin than to alternative courses. The pressure of opinion which forces the pupil towards the Latin option as "superior" may be the deciding factor.¹

These differences, whatever their cause, should have a definite bearing upon the teaching techniques of our schools. Material presented to pupils in the Commercial Course and Science Courses must be simpler or more concrete in character than that presented to those studying for Arts or the percentage of failures will be higher. The wide variation in intelligence between pupils in any one course is of course a complicating factor. As has been shown, there are pupils of outstanding ability and pupils of very low ability in every group. The intellectual capacity of individuals in these extreme categories must be recognized by the teacher, otherwise the dull pupil will be unable to benefit at all by his school experiences, while the bright one will be bored by his slow progress. Both extreme types will very likely develop habits of inattention which may seriously interfere with later work whether at school or in the business world.

Achievement in School Subjects.

Further evidence is necessary on the range in intellectual level within one grade. How much do dull pupils actually know? How much do bright pupils know? Consideration of results from standardized achievement tests provides answers to these questions.

The New Stanford Achievement Tests were given to Grade VIII pupils in Schools A and C. At the time this was done (in December 1931, and January and February 1932), the students had been in Grade VIII for four, five or six months. Exactly one year later Grade VIII pupils who entered School C in 1932 were given the same test. The score of 93 corresponds to four months of Grade VIII on each of these tests. This is based upon a sample of 2000 pupils chosen to be representative of 10,000 students in 24 cities or districts of the United States. In spite of this range, the "normal" this offers has a limited value because of differences in curricula, grading and general educational administration policies found between different school districts.

The data secured are summarized in Fig. 2, which indicates the averages and the variation in distribution between different groups.²

The tests used are not of equal difficulty to Montreal pupils. To take one example, boys studying Latin in School A had an average score of 105 on the tests of arithmetic; the averages on the other tests range downward as low as 90 for the literature examination. Similar differences are found for the remaining groups. This may be due in part to deficiencies in the test battery. The arithmetic tests, for example, include material which is completely covered at one period or another in any school course; similarly, the test of reading ability should be of equal difficulty to pupils in any school system. The literature test on the other hand, is not universally applicable. Variations in literary tastes are found from one part of the country to another. The differences between American and Canadian school

¹ Some part of the explanation, it has been suggested, is possibly that the "bright" student has wide interests, looks most clearly to a university education, and is able to tackle Latin, the necessary requirement, as he would in fact tackle other disciplines of memory and mental application. It may be also that the student who appears less "intelligent" in these kinds of discipline looks for the more "practical" courses of study.

² Prepared from Table XI.

EDUCATIONAL ACHIEVEMENT RATINGS (NEW STANFORD)

FIRST YEAR OF HIGH SCHOOL

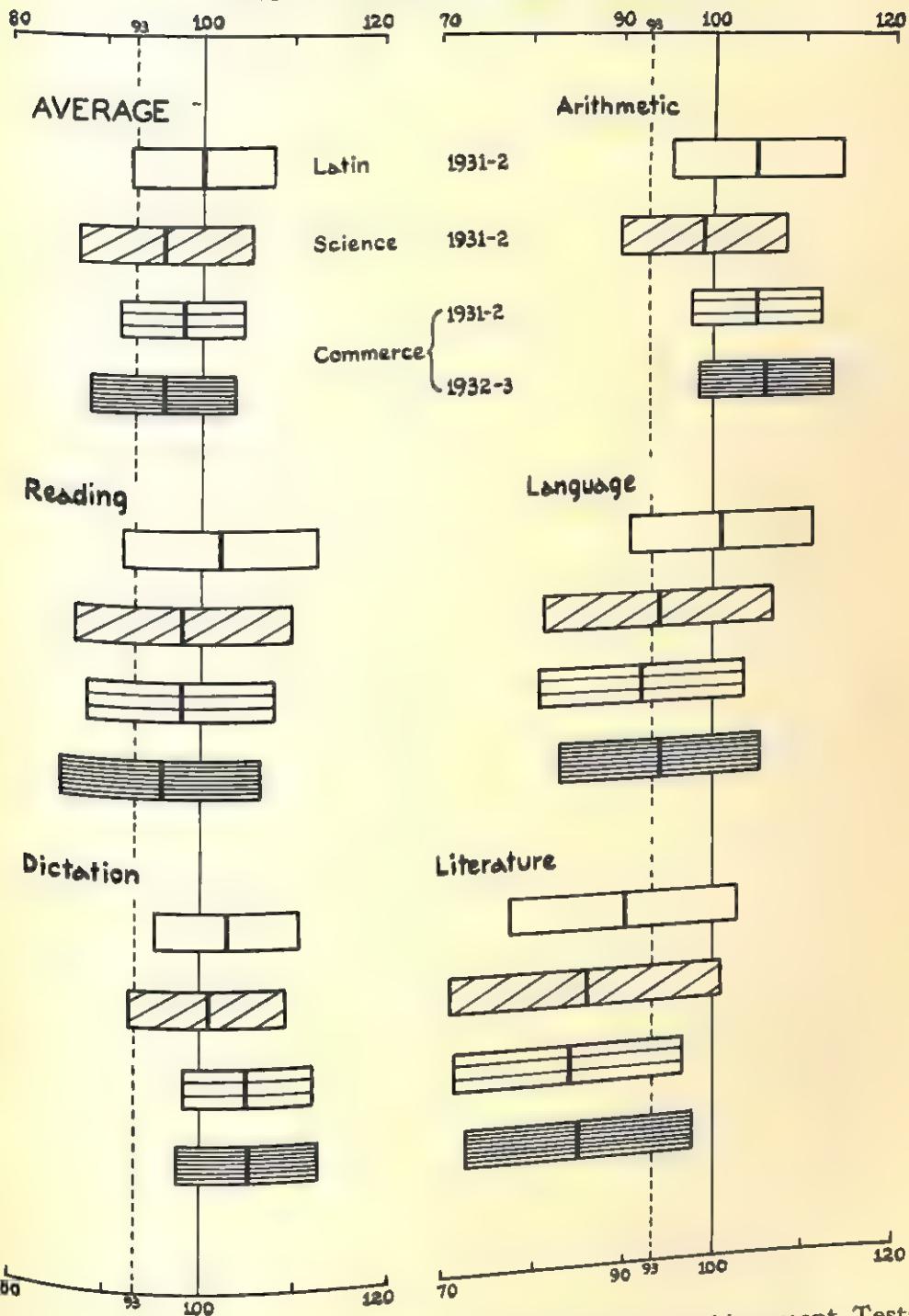


Fig. 2. Distribution of scores on the New Stanford Achievement Tests, boys at Grade VIII distinguished by option-groups. Bars show mean score \pm one standard deviation (middle 68 per cent of each group).

systems in the school work in literature is greater than the variation in arithmetic. It is impossible because of these differences to regard the tests as of equal indicativeness. Consequently the average from one examination should not be compared directly with that of another; a difference in the average scores between two tests does not necessarily indicate a difference in level of achievement.

Pupils taking the Latin option have higher averages on all tests than have those taking the science alternative. These differences appear statistically significant in the case of reading, language usage, arithmetic and the average of all tests given. Dictation and literature differences are more likely to be due to chance. It is improbable that the difference can be explained in terms of Grade VIII education as these boys had been under the same teachers since entering secondary school. As they graduated from the same elementary school, also, there were no differences in their previous formal education. The inference is that pupils who have benefited most throughout the elementary school regime tend to select the Latin option.

This supports the data in a previous chapter concerning the educational preferences of Grade VII pupils. It does not mean, however, that none of the better students enter the Science course. On the contrary the range in scores of Science pupils is greater in most instances than that of Arts students. Approximately two-thirds of the pupils in each group obtained marks between the limits shown in the graph. The remaining third obtained scores distributed above and below the limits indicated. Thus the average Science pupil is inferior in achievement to the average Latin one though individuals taking the former course may be the equal of any in the latter.

The differences between pupils studying Arts and Commercial subjects are not consistently in favour of the boys following the Latin course. The two prove to be equal in the case of arithmetic and there are 99 chances out of a 100 that Commercial pupils are superior to the Arts ones in dictation. The Arts students are definitely superior to the Commercial ones in reading, language usage and literature. It must be remembered that both groups had graduated from the same elementary schools and themselves elected their secondary school course. The differences may be ascribed to the Grade VIII curriculum in the two schools, to teaching methods, or to the quality of the students making each election. Supplementary evidence supports the inference that initial differences in achievement exist between the two. Fifty-six Commercial School pupils were given this same group of tests when they required one month's study for the completion of Grade VIII. The Language pupils proved superior to this advanced Commercial group on all examinations in which they had shown a superiority over the Commercial School pupils who formed one of the samples.

Pupils in the Commercial course rated as definitely superior to those in the Science course in dictation and arithmetic, but chance accounts for the remaining difference in average scores between these two groups.

Attention should be drawn to the large individual differences which are shown to exist within any one group. This substantiates conclusions drawn from intelligent test data. One example may be taken as illustrative. About one-third of the students in the Arts Course made scores which were either above 112 or below 92. Reference to the published forms shows: (1) the average score of 102 (secured by these boys) corresponds to an educational age of 15 years and 11 months; (2) an educational age of 17 years and 4 months corresponds to the score of 112; (3) the score of 92 indicates an educational age of 14 years and 4 months. Thus one-third of the class is divided into two groups separated by three or more years in actual educational achievement, yet all pupils are expected to benefit by the same teaching.

Similar comparisons can be made for each of the other groups on each of the tests.¹

One further achievement test was given (in November 1932) to pupils in School A. The American Council Beta French Test was administered to Grade VIII and Grade IX students. It was given as part of the regular November School examinations, although the results were not finally incorporated in the school marks. The examination was given only to pupils in Grades VIII and IX in the one school and comparisons can be made here only between results secured in these grades. To ensure strictly comparable data a segregation of scores was made. Marks were included only when the boy met the following qualifications: (1) spoke only English at home, (2) was taking his grade for the first time, (3) took the previous grade in a Montreal school. This had the effect of limiting the dispersion of scores. Boys speaking French or a foreign language would naturally have an advantage over English-speaking pupils taking this examination. Similarly, students repeating their grade might have an advantage over those who had not worked through the course of study for that year. Scores were not included of these boys who might be expected to do well. On the other hand, pupils who had had their previous schooling outside of the Province of Quebec - or even in the rural schools of the Province - do not have the same opportunities to study French as have those who graduated from elementary schools in Montreal.

The three sections of the tests dealt with vocabulary, comprehension of French, and French grammar. The results were analyzed separately and as a composite. Fig. 3 indicates the distribution of scores around the average.²

There is a considerable variation in scores within a grade on each part of the examination. Thus the average Grade VIII pupils had a score of 57.3 on the vocabulary test, while 25 per cent of the class obtained scores below 47.8, and 25 per cent had scores above 67.6. Grade IX pupils gained an average score of 65.1, although almost 25 per cent of this grade obtained scores below the average for Grade VIII. The true range in achievement for comprehension of French and French grammar apparently cannot be determined on the basis of data from this particular Test. The test of comprehension of the basis of data of the test of grammar was too difficult. Thirty-five was too easy and Grade VIII pupils scored within 11 points of the maximum on the test of comprehension while twenty-five per cent of the Grade IX pupils scored within 7 points of the maximum. On the other hand 40 out of 268 Grade VIII pupils obtained scores of three or less on the grammar test.³

The fact that the test of comprehension is too easy and the test of grammar too difficult does not diminish the value of the total score. The range in scores of the middle 50 per cent of the pupils is 44.7 points and 38.5 points for Grade VIII and Grade IX respectively. The amount of variation between the best and the poorest pupils is indicated by the fact that the total range of scores is 131 and 141 respectively for Grade VIII and Grade IX while 220 was the highest score possible.

¹This wide range in achievement, indicating that some pupils are much better prepared for the work of the grade than are others, must not be thought of as peculiar to the Montreal Schools. For example, in the "Guide for Interpreting" the New Standard Achievement Tests the authors give the standard deviations for scores of 192 Grade VIII pupils on each of the tests. In every case they are larger than the greatest found in any of these four groups of Montreal pupils.

²Prepared from Table XIV, Appendix.

³The test consists of 60 sentences in which one phrase had to be translated into French; the correct French was provided for the remainder of each sentence. The following are the first five phrases: "Give me", "is white", "her paper", "name is", and "the others".

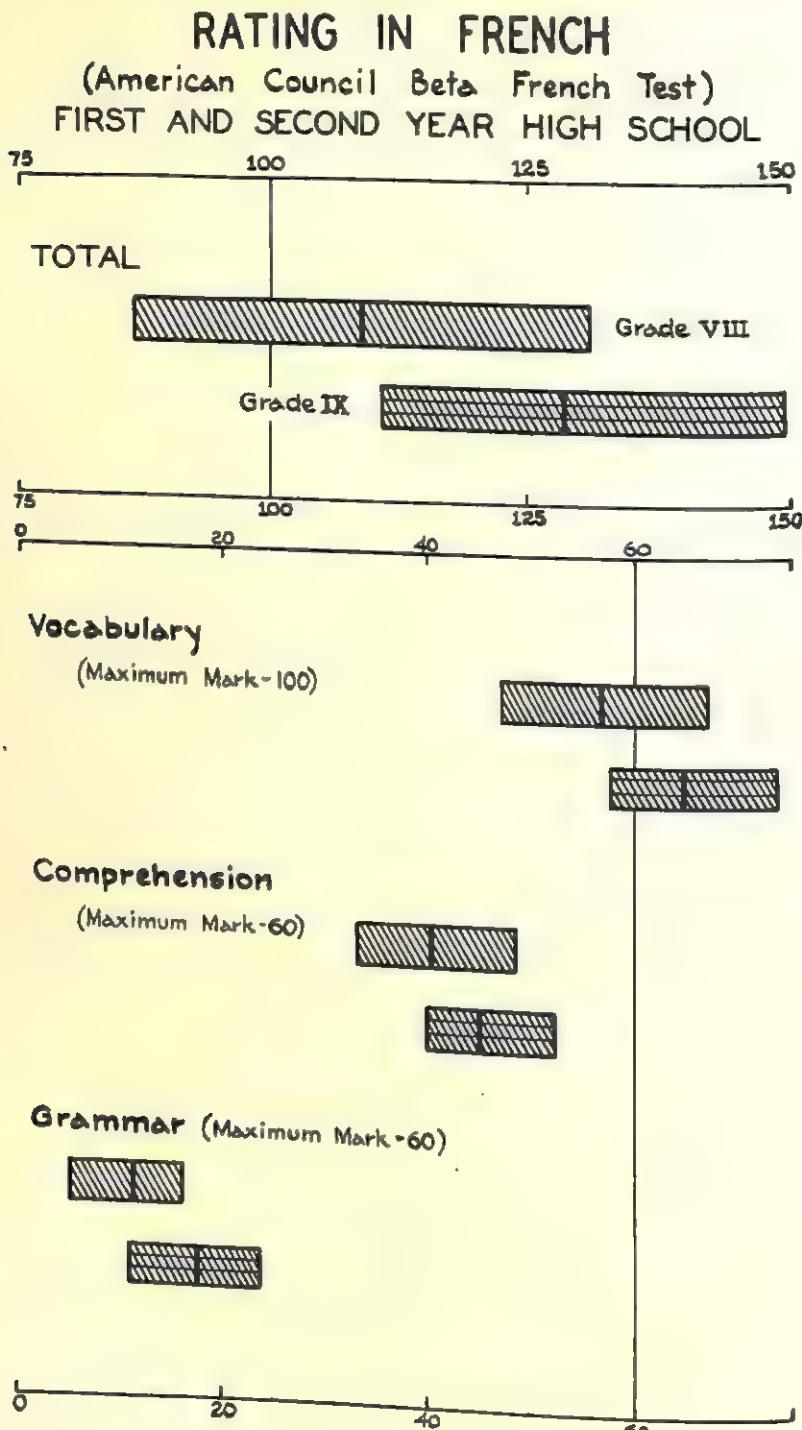


Fig. 3. Distribution of scores on American Council Beta French Test, boys in Grade VIII and Grade IX, School A. Bars show median and quartiles (middle 50 per cent of group).

The large amount of overlapping between the two grades is most significant, as can be seen in Fig. 3. About one in every four of the Grade VIII pupils was superior to the average boy in Grade IX. The achievement of the poorest 25 per cent of Grade IX pupils was no greater than that of the average Grade VIII student. This conclusion can be drawn both in respect to each part of the test and to the total score.

By this study of the distribution of intelligence ratings and of scores on standardized educational achievement tests, two valuable clues to the problem of guidance have been provided. There is a "natural" tendency for students to select courses on the basis of their abilities. But the variations of achievement and ability among pupils in any one course are so great that we cannot conclude that the individual pupil selecting a particular course is either better or poorer than the one who selects another course.

The scores with which we have been dealing do not agree perfectly with school marks. The choice of course made by a pupil apparently depends in part upon his past achievement, and school marks are his sole guide to this - unless he is the (perhaps somewhat unusual) student who has a clearly-felt conviction or "drive" towards certain fields. We may expect Grade VII school marks to be distributed in a manner similar to standardized test scores if there is a conscious selection of course on the basis of past achievement. But we cannot expect to find material in school marks to substantiate the findings shown in this chapter on the range of achievement within a grade. School examinations are too limited in scope to give trustworthy information on this point.

Chapter 9

Are There Differences Between the Students Who Choose Different Courses?

(b) School Marks

School marks, particularly at Grade VII, are of great importance, since a promotion to high school depends upon them. They are the only criterion of achievement and ability which is available to both parent and pupil. To what extent can they really rely upon these marks? It has been shown that school marks in Grade VIII are very consistent with those secured in Grades IX and X. From the point of view of the individual pupil whose marks are not sufficiently high, this perhaps indicates a regrettable rigidity. But this consistency may also give the marks value in educational guidance. The question needs to be carefully considered. Is the stability and significance of the mark an illusion? Or does an average Grade VII mark or, for example, 73 per cent have the same meaning each year?

The consistency of the Grade VII marks cannot be determined directly. But an indirect indication can be gained from an examination of the similarity in distribution of Grade VII marks for different high school entrance classes. Their usefulness for guidance depends upon the extent to which their distribution runs parallel with that of intelligence tests and standardized educational tests.

School-leaving marks (i.e., for the final year of elementary school) were obtained for all the pupils examined in Schools A, B, and C. However, these are not exactly comparable as promotion in Schools B and C is half-yearly; students from these schools were included on the basis of their Grade VIII examination marks in June 1932 and 1933. Some with low Grade VII marks probably failed the first half of their Grade VIII class: this would raise the observed Grade VII averages in that school. However the data within Schools B and C are entirely comparable.

Grade VII marks can be evaluated according to the presence or absence of expected differences. Psychological and educational test scores indicated that Arts students in School A were superior both to School A Science pupils and to those in School C. The test scores for Grade VII pupils indicated that Jewish students obtained higher school marks than non-Jewish ones. (Practically all School B students are Jewish). Grade VII marks, if consistent with these previous findings, should indicate that School B students have better elementary school leaving records than have those in School A. Grade VII marks should be higher for the Arts group of School A than for Science or Commercial groups; and these latter groups should be more or less equal.

The distribution of Grade VII marks of pupils entering Schools A, B and C in September 1931 and 1932 is shown in Fig. 4. Clearly a definite selection had occurred between Grade VII and Grade VIII. The average mark of the 500 pupils examined in Grade VII was 71.9 - while 74.4 was the lowest average for any secondary school group. Nine of the fourteen groups compared in Fig. 4¹ have average Grade VII marks of 78 or over. Some such difference was to be expected as Grade VII pupils with marks below 65 were not promoted, and the possible range of these marks among Grade VIII students was only 35 points.

Groups entering secondary school in September 1931 had higher marks in every instance than those entering in September 1932. This may indicate a real change in the quality of students or it may be the result of uncontrolled factors which influenced the examinations. The latter alternative is probable as there are inconsistencies between the examinations of different years.

On the data secured, Grade VII marks differentiate pupils in a

¹ Table XVI, Appendix.

DISTRIBUTION OF GRADE VII EXAMINATION MARKS

(MIDDLE 68 PER CENT OF GROUPS)

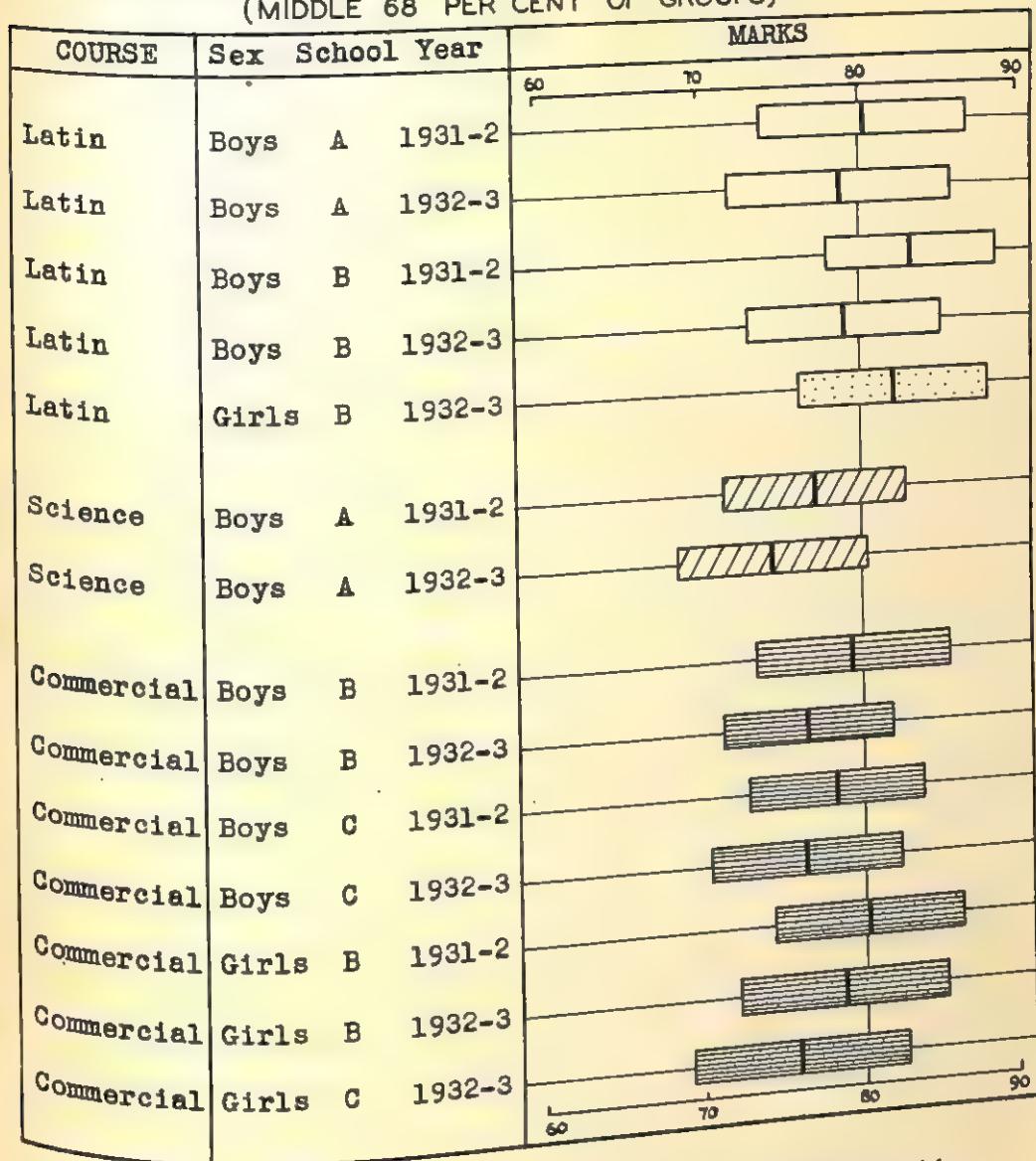


Fig. 4. Distribution of examination marks, high school boys and girls, Grade VII, distinguishing main optional groups. Bars show mean one standard deviation (middle 68 per cent of each group).

manner similar to psychological test scores. Matriculation pupils in School B obtained the highest average. Commercial students within this school were inferior to their companions in the matriculation course. The Arts group in School A were superior to the Science ones and to the students in School C.¹

Comparisons can be made between boys and girls. Girls consistently had higher marks than boys. This agrees with the conclusion reached when Grade VII pupils were studied. The observed differences, while not entirely reliable, consistently indicate the educational superiority of girls. (This does not necessarily mean that all girls are better than boys, on the average. It may mean that only the brightest girls are sent to high school, whereas more boys are given a chance to go).

In spite of the close agreement in differentiating pupils shown by examination marks and psychological test scores, the value of Grade VII marks for vocational guidance is limited because of differences in standards from year to year. A good deal of detail needs to be known of Grade VII marks for a particular year before we know the value of a given mark. The next stage therefore is to enquire what is the significance of a particular high school mark? How does it differentiate pupils in the various school courses? Does a mark of 80 in French, for example, have the same meaning as one of 80 in Algebra? Does it have the same meaning from year to year and from school to school?

The Distribution of Subject Marks.

Grade VIII marks are available for pupils in Schools A and B who wrote their examinations in June 1932 and in June 1933. Marks in particular subjects can be compared for two consecutive Grade VIII classes in School A.² Their indications are the following:

(1) A few low marks in every subject tend to pull down the general averages.

(2) The pupils writing examinations in 1932 made higher marks than those writing in 1933. Judged by their marks, Arts pupils in the latter year were inferior to the 1932 Arts class in every subject except spelling; the difference was very marked in four of the eight remaining subjects. The same tendency for the 1932 pupils to obtain higher marks is found in the Science group: Geography and General Science provide the only exceptions.

The significance of these differences was shown by determining the percentage of the students writing examinations in 1932 who obtained marks higher than the 1933 average. The differences, which favour the former group, are consistent and some of them are striking. Two examples will suffice. Two-thirds of the pupils in the Arts course in 1932 obtained marks in arithmetic higher than the average in 1933. On the other hand 70 per cent of the 1933 class were superior in geography to the 1932 class. Are these true differences? This is doubtful. It is hard to believe that two-thirds of one class is superior to the other in arithmetic and inferior in geography. Such discrepancies are almost certainly the result of divergences in the examinations.

(3) The relative difficulty of subjects is consistent over the two years. Four of the five subjects given the highest marks in 1932 rank among the five best subjects in 1933. This applies to both the Arts and the Science sections. Further, four of the five most difficult subjects, as measured by school marks, are common to both years of each section.

¹ Tables showing the reliability of these differences are included in the Statistical Supplement.

² Extensive data on this are given in the Statistical Supplement.

³ This is in keeping with the fact that higher Grade VII marks were obtained by students entering Grade VIII in September 1931 than by those entering high schools in 1932.

The comparisons so far made have been restricted to Grade VIII pupils following matriculation courses in School A. On both the standardized tests and the Grade VII examinations, Arts students obtained higher marks than Science students. Do these differences continue into Grade VIII? The evidence suggests definitely that they do. Pupils taking Latin in 1931-1932 had higher marks in every subject than those taking General Science. Seven of the ten differences were statistically valid. Also, when marks in Latin itself are compared with those in General Science, Latin marks show definitely higher. The differences registered in the following year are not as great although the Arts students obtained the higher marks in every subject. But in the same year the weakness of school marks in vocational guidance is particularly evident in one glaring inconsistency: marks in the subject General Science were considerably higher in 1933 than they were in Latin. This reversed the situation of the previous year and is not in keeping with pupils' standing on other examinations. The source of the difficulty is easily determined. There was a very slight change in the General Science average mark between the two years. But the average Latin mark in 1932 was 72.3; a year later it was 60.5. As a result, 73.5 per cent of the pupils obtained marks in Latin above the General Science average in 1932, while the year following only 31.4 per cent of Latin marks exceeded the General Science average. Can this change be best explained by a difference in the quality of pupils or by discrepancies in the difficulty of examinations? The latter alternative seems obvious. We have verified that, in general, marks are consistent from grade to grade. We can only conclude that students were fortunate who wrote their Latin examination in 1932.

Sixty-eight per cent of Arts students received total marks which were above the Science average on the 1933 Grade VIII examinations; the previous year more than 75 per cent of the former were superior to the average of the Science students.

A pupil to be promoted unconditionally must obtain either an average of 65 or marks above 60 in all individual subjects. The general average of Science pupils in June 1933 was below 60 in French and arithmetic, below 65 in English, literature, history, algebra, and below 65 in the average for all subjects. The Arts section of the 1933 Science students had an average of below 65 in Latin only. The preceding year Science students had average marks below 60 in grammar and French, while all others were above 65. These low marks in certain subjects force the conclusion that there is something radically wrong with the marking system in this school. The alternative is that a great many pupils are following a course of study from which they receive no benefit. Both alternatives place a considerable responsibility upon the school authorities. In either case, courses are in operation which can be passed by only about one-half of the pupils who attend.

Commercial Course and Matriculation Students Compared.

We cannot generalize conclusions concerning marks from a study in one school. Consequently Grade VIII marks were examined for School B students who wrote their examination in 1932 and 1933. There is no Grade VIII curriculum in this school to correspond with School A's Science Course. All matriculation pupils study Latin in Grades VIII and IX. They can then select a Science Course as a Grade X alternative. Marks of the matriculation and Commercial pupils were examined separately and comparisons made between the two.

The Grade VIII matriculation class obtained higher average marks (in 1933) than the class of the previous year in seven of nine subjects. Six of these subjects differ in relative difficulty by one rank or less. Yet when the two years are compared over 70 per cent of the June 1932 class were below the 1933 average in literature, spelling, history and French. This tendency is just the reverse to that found in School A where the examination results in June 1932 were much higher than those of the following year.

The semi annual promotions in School B may account for the fact that the average mark in every subject was above 65 both years. But there may of course have been other selective factors involved; the pupils may have been superior, or marking may have been more generous than in School A.

Commercial Course students take certain subjects in common with the Matriculation pupils, but study accountancy, shorthand and type-writing instead of Latin.

When the marks of these commercial pupils were examined real differences were found in six of the twelve subjects. Three of these favoured the 1932 and three the 1933 class. All other differences are explainable by chance factors. Thus the marks vary in a different manner from those in the Matriculation Course although most subjects are common to the two groups.

Certain subjects are taken by both the Matriculation and the Commercial divisions of School B. Comparisons may be made between the distribution of marks in these two sections, for both the 1932 and 1933 classes. While all matriculation pupils were boys, data referring to commercial students include the records of girls. As already noted girls in Grade VII show higher marks than boys of the same age. If this difference in academic achievement continues through high school, grade results will not be strictly comparable. The effect of this difference will be to raise the marks of the commercial classes.

As it turns out, there is very little difference in marks of pupils following commercial and matriculation courses. The only real differences in 1933 were in history and arithmetic where the matriculation group was superior.

We have been considering similarities and differences within one school. We have not dealt with the order of difficulty of subjects but in each school this was consistent: subjects found difficult one year were difficult the next. The distribution of marks was consistent in School A as the Arts groups were superior to the Science and the 1932 class had higher marks than the 1933 one. It may also be noted that large percentages of students failed in certain School A subjects. School B marks showed even greater consistency. The 1933 examination results were superior to the 1932 ones in the Matriculation course while there was no definite tendency for commercial students' marks to be superior either year.

Are School B marks consistent in any given year with those in School A? That is, does a mark of 73 in history, for example, have the same significance in the two schools. This question is answered through a comparison of School A and School B matriculation marks for Grades VIII, IX, and X. We will deal only with results of students who entered Grade VIII in September 1931, wrote their Grade VIII examinations in June 1932, Grade IX ones in June 1933, and Grade X examinations in June 1934. This discussion of Grade IX and X marks is only in reference to boys with successful high school records. Both schools are under the jurisdiction of the Protestant Board of School Commissioners. Each sets its own examinations. There may be a few exceptions to this but they are not consistent. Consequently we cannot state that a particular comparison of marks between the two schools is based upon the same examination. However, the subject matter taught in Grade VIII, Grade IX, and Grade X is identical.

Pupils in School B obtained higher average marks than those in School A in 25 out of 30 comparisons over the three years. This is partially a result of the difference in the promotional system of the two schools. Promotion tends to be more frequent in School B than in School A. In School B, the decrease in pupils between Grade VIII and Grade X is less than 20 per cent; in School A it is nearly 50 per cent.

The total range in marks assigned differs but slightly between

the two schools. In fact there are much greater differences when subjects within one school are compared than when comparisons are made between schools.

We would not expect marks to be exactly the same when schools are compared. But are the differences sufficiently great to be of practical importance?

School B Grade VIII marks in spelling, arithmetic and geography are significantly higher than the comparable School A marks. Seventy per cent of the School B pupils exceed the average spelling mark in School A while more than 60 per cent were superior to the average School A student in French, arithmetic and geography. On the other hand more than 60 per cent of the School A pupils had marks above the School B average in drawing and composition. The practical significance of these differences is considerable. A pupil in School A with an arithmetic mark of 68 is just average. A pupil in School B with the same mark is surpassed by almost three out of every four classmates. Some of the differences for other subjects are not as great; some are greater.

The differences between the two schools in Grade IX are even more marked. School B pupils are superior in nine out of eleven comparisons. Eighty-five per cent of them had higher marks in French and Latin than the average School A pupil. On the other hand eighty per cent of School A pupils were superior to the average student in School B in English composition. In addition to these subjects, more than 65 per cent of School B pupils were superior to the average student in School A in drawing, grammar, history, algebra and arithmetic. A consideration of the general average Grade IX mark shows that only 16 per cent of the 146 School A students had marks as high as the School B average. These comparisons indicate clearly that it is impossible to compare Grade IX marks in two schools or predict the latter from Grade VIII marks in another school.

The tendency for marks in School B to be higher than those in School A continues in Grade X but the discrepancies are not as great as in Grade IX. Composition is the only subject where 75 per cent of School B students are superior to the average of School A. Certain inconsistencies can be noted between Grade IX and Grade X marks. Sixty-five per cent of Grade X School A students are Grade X marks. The average of School B in French. The previous year only 14 per cent of the School A Grade IX students had marks above School B average.

It may be concluded on the basis of this study of marks in Grades VIII, IX, and X that differences in marking between the two schools are so great as to vitiate comparisons between one school's pupils and those of another. The differences in marking within one school differ to such an extent from year to year that prediction of future examination rankings from marks in a current year is only possible when a thorough study is made annually of their distributions and interrelations. Standardization of marking procedures and further research might improve this situation measurably, but it is obviously not a practical recourse for the individual parent.

What practical conclusions are to be drawn from this examination of examination marks? There are several of considerable significance.

1. Pupils tend naturally to seek courses which are in accordance with their abilities. There is clear recognition on the part of many boys or girls that they cannot succeed in a Latin matriculation course, and these seek other curricula. When we examine the marks they received in Grade VII after they settled in a particular high school course, it is evident that these marks divided them in the same manner as ratings on psychological tests. Thus superficially Grade VII marks appear to have considerable prognostic value. They apparently predict scores on standardized intelligence and educational tests.

2. The weakness of Grade VII marks is their variation in meaning from year to year. The parent cannot be certain that a particular mark, say 71 per cent, stands for the same thing this year as it did last. He cannot tell whether the mark indicates greater or lesser comparative achievement. The pupil's rank position in the class is probably more significant than his actual mark. The weakness of pupils : probably no more than 40, perhaps only 20, and these may have been selected to make an inferior or superior class.

3. Similar weaknesses in school marks apply to the high school grades. Marks in a particular year may be highly consistent in averages and between subjects within one particular school, yet they vary so much from year to year that they are actually meaningless. Again, a pupil's rank order is much more important.

4. School marks are not comparable from school to school. Whatever consistency these may have within one school it disappears when schools are compared.

5. There is much variation in the difficulty of examinations in Grade VIII from year to year. The differences in average marks from year to year are so great they cannot be accounted for by variations in the calibre of student.

6. While these conclusions throw doubt on the indicative value of school marks, the trends of marks agree closely from year to year within the one school. Grade VIII marks are very definitely related to those obtained in the higher years. Some Grade VIII classes are more fortunate than others in securing high marks; these continue to secure high marks.

7. Another significant tendency shows itself. Many students with inferior Grade VII marks, decide to enter courses where they need not study Latin. The hope that this will meet their aptitudes proves illusory, however, for a large proportion fail at the end of Grade VIII. This trend is important enough to form the topic of a separate chapter.

Chapter 10

Work Interests and the Choice of Courses.

It is hardly necessary to emphasize that a boy's vocational history will be vitally affected by his educational career. Because of this we have stressed the importance of educational choice at Grade VIII. Apparently this choice at present is most influenced by the abilities and achievements shown at Grade VII. At least the pupils with the best school records usually study Latin in Grade VIII. Do intellectual qualifications, as far as they are measured by school subject marks, really determine the choice of a high school course, or do interests play the major rôle? These, of course, are not absolute alternatives; they could work in conjunction. Pupils low in intellectual and academic ability might shy away from certain optional courses: those high in these abilities might choose courses which come close to their interests and tastes.

A number of these interests which differentiate pupils will be considered in this chapter. At the outset of this enquiry into Grade VII students' interests, one important point should be noted. Almost half the Grade VII students had no notion three months before they graduated of the course they would commence in September. Whatever preferences they may have had were so vague they could not be named; their actual choices were apparently made at the last moment.

The Analysis of Work Interests questionnaire devised by J.B. Miner was completed at home by 247 boys who were in Grade VIII of Schools A and C. The latter pupils were in the Commercial course while the former were studying either the Arts or Science matriculation course.

The 247 boys expressed in all 317 choices of work. The jobs they wanted covered 48 different occupations, many of them desired by only one boy. Fourteen occupations were desired by boys following each of three courses of study, however, and more than half of the total choices desired by more than one individual are included in these fourteen fields.

Twenty-five per cent of the group were unable to state any vocational preference. On the other hand, twenty-seven occupations mentioned by commercial students required university training which these boys could not receive.

This information indicates that Grade VIII students do not usually choose high school courses as a deliberate preparation for definite occupations. Perhaps this is just as well. The boy of 13 may be too young and immature, and almost certainly he knows too little about specific occupations to choose intelligently one career rather than another. A narrowly-conceived occupational goal may be a handicap to the growing boy; yet some vocational desire should be a definite incentive toward good school work. The boys unable to state any work preference, together with those in the Commercial course who wanted university training had a distinct academic handicap - unless it can be conceded that they wanted education for its own sake. Unfortunately this must be considered improbable or rare. The boy with an occupational ambition which can be satisfied through graduation from his high school course is in a much more favourable position. He has something to work for. The uninteresting and difficult subjects in his curriculum will probably be mastered if his ambition is one he can achieve and is somewhat general in nature, e.g., "a university course", "a bookkeeper", "machinist", etc.

The ambition, however, should be flexible. Guidance must be directed with due account taken of the boy's possible achievement. This will ensure a minimum disappointment if he is unable to master the necessary academic prerequisites, or if his personality development is

such that non-intellectual qualities would bar his success in the occupation of his choice.

The solution to the problem of vocational choice in Grade VIII is the development of general rather than rigid ambitions. Vocational information, carefully organized and placed sympathetically before the pupil in the later years of elementary school, would probably rectify the present deficiency. Where strong vocational desires exist they are commonly on too high a level. Most occupations desired by these boys required university training. Yet only a small percentage of them later enter a university. The emphasis placed upon matriculation by the school system probably accounts in part for this. There are other factors, however, which may be even more important. A considerable percentage of parents insist that "my child will go to college" without considering either the child's abilities or their own financial stability. In many instances the parents' ambition for the children is just as much a hopeful wish as the most fanciful thinking of the adolescent.

It is interesting to compare the attitudes of the unemployed boys and the school groups toward vocations. The boys who had been out of school for some time were much better informed, even though 50 per cent of them simply wanted "jobs". The preferences given by the remaining 50 per cent were very realistic. Work was wanted of a kind which might be available, e.g., office clerk, store assistant, delivery boy.

A boy may have well defined interests which affect his choice first of a school course and later of an occupation. Yet he may be unable to express these in terms of specific job ambitions. Miner's "Analysis of Work Interests" attempts to tap the more fundamental of these interests. Interest in certain groups of school subjects is the most probable apparent reason for selecting one curriculum in preference to another. School subjects are therefore grouped together in eleven sections; students indicated the two groups which they liked best. The percentages of boys preferring each of the groups of subjects are shown in the Table below. Each boy marked two choices, so that each individual percentage must be valued accordingly. Thus if all boys marked a particular group of subjects the percentage in the table below would be 50 as each boy gave two choices.

Table 5. Groups of Subjects Preferred

Subjects	Arts	Group Sci.	Comm.
Art: freehand drawing, design, craft work	19	17	9
Commercial Subjects: bookkeeping, arithmetic, commercial geography, salesmanship, shorthand, spelling, typewriting, writing	9	7	42
English: rhetoric, literature, expressional English	7	0	4
Foreign Languages: French, German, Latin, Spanish	14	7	5
History and Civics: Canadian, ancient, medieval, modern	11	7	10
Household Economics: cooking, millinery, sewing	0	0	0
Industrial Subjects: mechanical drawing, shop training	8	11	9
Mathematics: algebra, geometry, trigonometry	14	14	15
Music	2	2	1
Science: general, botany, chemistry, physical geography, physics, zoology	14	34	3
Other subjects	1	1	0

Commercial students generally ranked the commercial subjects as one of the two preferred. Only just over half the Science students, however, included the science subjects in their preference. No group of subjects appeared to be strongly preferred by the students who were taking the Latin option. It is clear that these boys did not choose their course because of their interest in this subject. Perhaps interest in school subjects is a factor in the choice of a Commercial course; but this cannot be concluded of the Science course in which mathematics play a prominent rôle in the upper grades.

Many Grade VIII students fail to complete high school. Do boys with successful high school records have a greater homogeneity of interests in school subjects? This question was answered only for boys in the Arts and Science divisions of School A. The answers to the Interests questionnaire were retabulated for students who completed Grades VIII, IX and X in three years. The total number of boys becomes too small for exact statistical comparisons, but the results are interesting. There is no change whatever in the preferences of those choosing Latin; there is one minor alteration in subject interests of students studying general science. Fourteen per cent of their Grade VIII preferences were for mathematics but there were 21 per cent of preferences for this group of subjects among those completing Grade X. We can conclude that in general the selection of matriculation courses, by both successful as well as unsuccessful students, is not based on a homogeneous interest in the school subjects.

Two other types of information were secured on the Analysis of Work Interests Blank, but gave negative results. Pupils were asked to check the kinds of work activities which they preferred. These included such things as growing plants (farming, gardening, etc.) operating engines (locomotives, automobiles, etc.), and so forth. No differences were found among the three groups of students in Grade VIII, probably because the activities were too general. Students were also asked to check two of the following in accordance with their preferences: "making useful things", "producing artistic results", "dealing with people", or "thinking out problems". Again no differences were discernible among students in the three courses. A possible interpretation is that boys at Grade VIII who are still at school have not in most cases thought realistically about their future work. The other conclusion, however, is that the subject choices possible at Grade VIII do not have any distinctive "sorting-out" value at all.

Certain real work interests were found on another section of the questionnaire. Thirty seven pairs of contrasted interests in working conditions are given here, and each boy checked which he would prefer in each group who selected the first alternative.

There are several real differences between the preferences of commercial and language students. The former showed greater preference for indoor office work, with regular hours, in one location. The job according to their choice should require common sense and sympathetic understanding. If artistic work is necessary this should require an artistic taste rather than artistic creation. Arts matriculation students either preferred the alternatives to these or were less unanimous in their choice. Little homogeneity was apparent among the Science students. They preferred accuracy to originality in work; whereas the latter was the choice of Arts students. Generally the preferences of Science students were intermediate between those of the Language and Commercial groups.

These differences are not great. But again there is a possibility that successful students tend to be more homogeneous than the Grade VIII class as a whole. Consequently responses were tabulated from those Arts and Science boys who passed satisfactorily the examinations in the first three years of their courses. There were many minor but no major changes in the work interests of these successful boys when comparisons were made with the total Grade VIII class. The changes

Table 6. Choice of Working Conditions by High School Boys

Percentage of boys in each group choosing the first
in preference to the second alternative.

First	Alternatives	Group		
		Lan	Sci.	Comm.
Indoor	Outdoor	36	36	65
Public Service	Private Service	38	40	53
Skilled hand work	Skilled heavy work	81	76	88
Slow movements	Rapid movements	27	20	21
Convincing people	Investigation work	21	19	41
Directing others	Following directions	62	65	58
Broad planning	Attention to details	43	32	41
Less responsibility	More responsibility	44	38	29
Organizing people	Constructing things	35	18	38
Working with things	Working with people	56	68	56
Working by yourself	Working with others	55	42	45
Operating appliance	Repairing appliances	74	73	73
Doing same thing	Wide variety work	21	30	37
Thoughtful hand work	Thoughtful head work	36	37	36
Methodical work	Meeting new conditions	30	37	29
Regular time for work	Irregular time for work	68	87	94
Preparing plans	Carrying out your plans	35	33	25
Work requiring energy	Work requiring patience	49	62	49
Work requiring judgment	Work requiring industry	68	65	36
Work requiring quickness	Work requiring reliability	30	28	43
Work requiring speed	Work requiring judgment	33	35	64
Work in one town	Work requiring travelling	30	40	39
Work requiring sympathy	Work requiring decision	9	9	73
Work requiring accuracy	Work requiring originality	55	81	86
Larger future success	Smaller immediate success	85	88	64
Work requiring calmness	Work requiring enthusiasm	53	44	71
Influencing people direct	Influencing people indirect	64	66	43
Work requiring inspiration	Work requiring thoroughness	36	28	38
Making things direct	Following own methods	28	35	76
Work requiring expression	Work requiring computation	64	56	56
Work requiring quick results	Work requiring perseverance	52	47	85
Working in an office	Work requiring teaching	51	76	57
Welfare Work	Take part in entertainment	38	36	75
Work requiring artistic taste	Work requiring artistic creation	38	49	86
Work requiring common sense	Work requiring special information	62	83	25
Increase amount production	Increase quality production	20	14	58
Greater pay and risk	Less pay and safety	38	37	58

were, however, all in one direction: there was an increase in the preferences which implied physical and mental activity. The suggestion is that the most active boys tend to be the most successful, but too much reliance cannot be placed on a small sample and the possibility deserves further investigation.

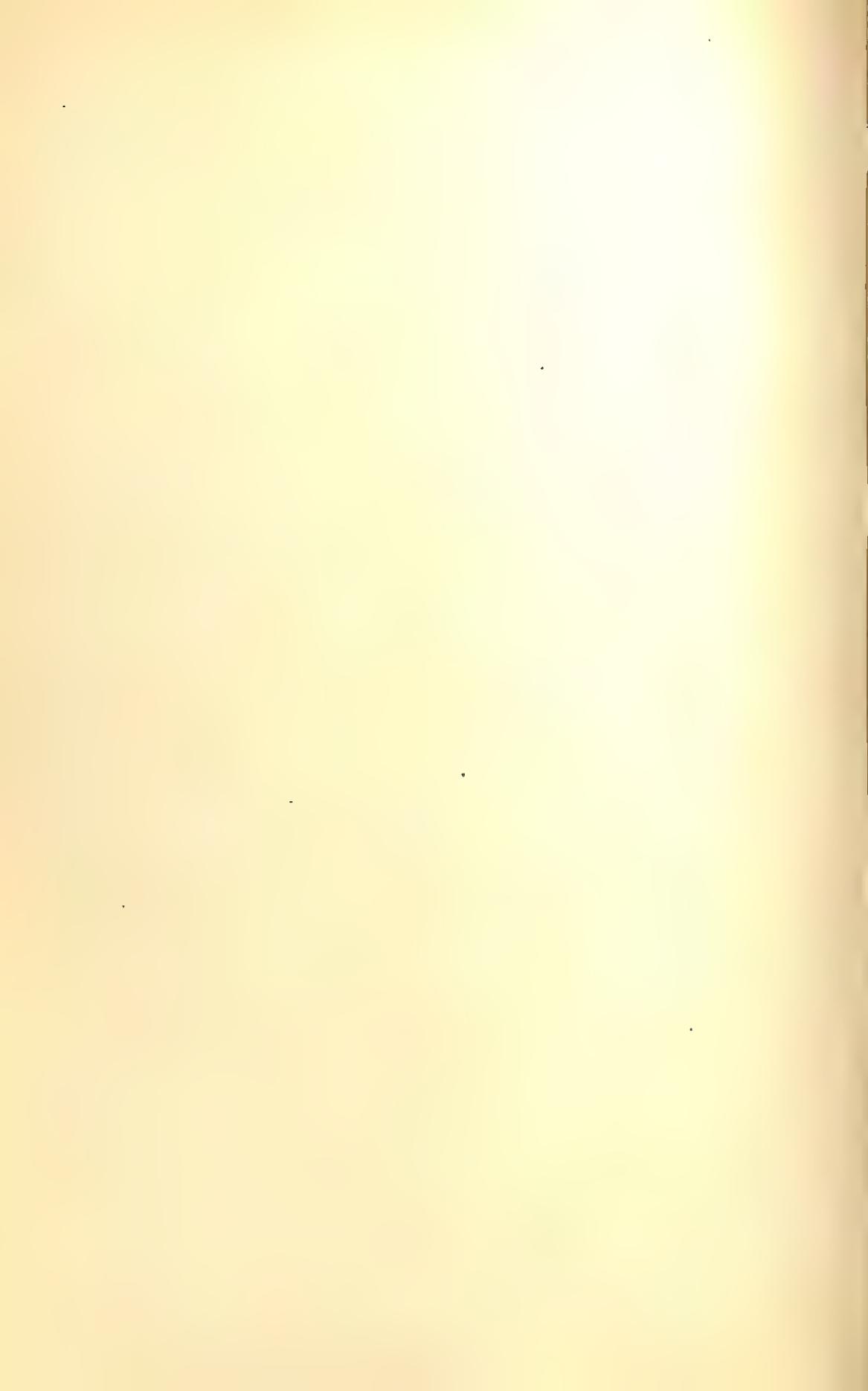
In sum, the information secured from the principal sections of the Analysis of Work Interests offers only slight guidance. No interest in types of occupations or specific careers appear, as a common bond between boys in one course of study, differentiating them from youths in other courses. A few differences were found in the working conditions preferred by lads in different courses. While these were statistically significant they were too slight to have practical value. The only major differentiating interest is shown in commercial subjects.

What is most important is that there is no evidence to indicate that most pupils select school courses because of their interests. Probably the reason given the writer is typical of many boys: "Why did I go to Technical School? Well, several boys living near me were going there and I thought I'd like to go with them". Another reason, which may play a major role in the selection of courses, is that students

are afraid of certain subjects. In particular, students with low Grade VII marks fear Latin as a hard subject and take whatever course is available not requiring the study of this subject. In effect, when a student is afraid of Latin and is not interested in a Commercial course his only alternative is a Science one.

This lack of agreement between interests and educational choices may simplify the findings of this part of the investigation. Nevertheless it is a most unhealthy condition. Vocational information given to the pupils during the seventh grade, and encouragement in thinking of the high school courses much more realistically in terms of their occupational value, could go far to change this selection; now casual or negative, it could become informed and positive. It may be suggested that knowledge about vocations, types of work, individual capacity-differences, etc., could be given in the course of teaching composition and certain other subjects without adding a new burden to the present Grade VII curriculum.

But another conditioning element is the extent to which there are significant differences in the courses of study. We know that there are differences in pupils who enter the various courses. Do these tend to increase or decrease as progress is made through high school? The intelligent selection of high school courses can only be made if there are a sufficiently adaptable range of courses to select from. The following chapters will examine the degree to which different groups of pupils are offered outlets for their abilities and achievements in school.



Part III
PROGRESS THROUGH THE GRADES



Chapter 11

Selective Criteria in the Secondary School.

Within their limits the three main school courses offered in Montreal appear to attract pupils with different degrees of ability and achievement, though not very clearly according to their vocational interests. What changes occur as these students pass through high school? Are there measurable psychological and educational characteristics which are distinguishable at the commencement of high school, and which mark off successful from unsuccessful students? Do the differences which we noted between pupils in the different courses increase or decrease as progress is made from grade to grade? In the light of what has already been related, these are perhaps the most important questions which faced this investigation. An answer may be sought by examining the educational records of students as compared with their scores on the tests other than school marks.

What is a satisfactory criterion of school success? Mere promotion is not enough. Certainly the student who drops out of school is not successful. But those who falter, and have to repeat a grade have failed in some part. The high school course requires four years and only those students who complete it in this time are truly successful by its own standards. There may, of course, be differences in the degree of failure between those who quit and those who are defeated. Yet these are all unsuccessful in the sense that they did not complete a task undertaken. The reasons may not all be matters of ability. Leaving out the question of lack of means on the part of the parents, the conditions of teaching and the emotional adjustment of the individual pupil must be queried for some share of the responsibility. None the less for the moment successful completion of high school in four years must be accepted as the criterion to differentiate the successful from the unsuccessful students.

Allowance must of course be made for students who are able to complete two or three years of their course without failure. They do not meet a full standard of success; yet they are not hopeless failures. The boy who completes Grade VIII and enters Grade IX the following September has succeeded in one year of high school. Similarly, the student who completes Grade IX two years after commencement of Grade VIII, and then enters Grade X has succeeded in half of the high school course. This partial high school success is recognized in what follows.

The distribution of psychological abilities and academic achievement among pupils following the various Grade VIII courses of study, have already been examined. The following chapters indicate the prognostic value of these measured. Those pupils who completed a given grade, regardless of the marks they obtained, are compared with those who started the course but did not complete that grade. We are concerned, throughout, only with students who entered Grade VIII in September 1931 or September 1932. It must be clear that gross misconceptions will result from reading the ensuing discussion if the criterion of school success used is not understood. Thus when we speak of Arts students completing Grade IX in 1934 we refer only to pupils writing the Grade IX examinations in subjects studied by pupils who had elected Latin in September 1932. Some of these had failed and repeated Grade VIII, some had transferred to other schools or courses, a few had secured work, and so forth. All of these are grouped together as "not completing the grade". Furthermore, students are considered to have entered Grade VIII only where test or other data concerning them is available. Thus it is stated in referring to the New Stanford Reading Tests that 79 boys completed Grade IX in the Arts Division of School A. Later the statement is made in reference to the arithmetic tests that 75 boys completed Grade IX. This and similar apparent discrepancies result from the fact that a few students were absent on each occasion when tests were administered. The figures refer, in other

words, to the total pupils who wrote the particular examination referred to.

Those students who are completely successful in high school, graduating on completion of four years study, not only write, but pass, the High School Leaving Examinations. Only those students who graduated in this way and whose names appeared in the published lists are referred to as completing Grade XI.

Principal Findings of Succeeding Chapters.

The four following chapters each deal with a different kind of information. Yet to read one, is to read all. There is monotonous repetition in recounting the major results of this study. Every test given indicated that students electing to take the Latin option, i.e., the "standard" Arts matriculation course, were superior to those taking general science or commercial subjects. Further, the general students were inferior to any other group. At first sight, it seems from this distribution of abilities that students believed certain courses to be easier than others. This kind of choice rather than the "interest-value" of the subjects was certainly a determinant. But the belief in the greater ease of the alternatives is an illusion. It will be most helpful to give first a brief summary of the conclusions of the following chapters, which will make this clear.

Differences in intellectual level between the students in the different courses proved to have largely disappeared by the end of the ninth grade. Only about 25 per cent of those who left the course were superior to the average student who completed Grade IX. The courses preferred by the lower-rating students revealed the largest percentages of poor students leaving. This selective tendency continued through Grades X and XI. The number of graduates, it is true, was small; but a similar degree of intelligence was necessary for success in each of the courses.

Results from the New Stanford Arithmetic Tests and the general average scores from seven examinations in this battery both indicated that identical initial achievements are required for successful completion of any of the Montreal High school courses.

With the reading test data from the New Stanford examinations, an unexpected and unexplained situation appeared. On this, as on the other tests, Grade VIII Arts students were superior to those following the alternative courses of study. The test had but slight selective value among the Arts students. The extent to which they dropped out or continued had no correlation with their scores. However, the reading tests had definite value in predicting the progress of Science students. Those who graduated were superior to Arts Course graduates, suggesting that a lack of reading skills was more significant among the Science than among the Latin students.

Prognostic tests of Latin and geometry achievement were given to pupils commencing the study of these subjects, while a clerical prognostic test was improvised for use with Commercial students. None of these proved satisfactory in predicting success for a substantial period (three or four years) in particular subjects. Each test apparently selected pupils successful in their course in much the same way as the achievement and intelligence tests.

The geometry prognostic test had but slight value in the prediction of students success in the Science Course. It proved, however, to have definite prognostic value for those in the Arts Course. This was unexpected as the Arts students take four mathematics courses less than Science students.

Within the school system as it at present exists, Grade VII school marks show the greatest selective value. They are "keyed", it would seem, to much the same kind of difficulties as are to be met in the

secondary school. The results presented in following chapters show that the student with a Grade VII mark of under 75 had practically no chance of succeeding in high school. There was a very slight possibility of those with marks between 75 and 80 graduating. A Grade VII mark of over 80 was the best single indication that a student would be successful. The criterion that a mark of under 75 was evidence that the student would fail, was checked for the three Schools A, B, and C.

In the next chapters the progress of students is followed through the grades, with these conclusions examined in detail. Each chapter emphasizes certain findings above all others : as measured among the pupils who remain in school, (a) the differences between groups are partially smoothed out by the end of Grade IX; and (b) they have practically disappeared by the end of Grade XI.

This study was concerned primarily with the progress of students for whom certain data such as Grade VII marks or test scores were available. It was nearly ruined by a fact incidental to the immediate investigations; yet of immense general significance. The school courses in the city are graded so steeply that only a small fraction of pupils who enter high school complete it without failure. Naturally the small percentage of successful students seriously limited the number of boys whose test scores could be dealt with at each grade level. This prohibited the use of more elaborate statistical devices which might otherwise have been used in the treatment of data.

The figures collected do not provide absolutely accurate data on the total number failing at different grades. They show the number only of "non-continuers" for whom we have definite information. Yet there is no reason to believe that these pupils differ markedly in general potentialities from other students. The high "mortality" among students on their way through high school is the most depressing thing revealed by the enquiry. The data from School A are believed to be complete for three successive years, and we find here that only twelve boys graduated without failure for every hundred who entered Grade VIII classes of this school in 1931. Sixteen graduated out of every hundred who entered in 1932 while 17 per cent of the Grade VIII pupils who entered in 1933 were successful. The percentages are somewhat larger for School B and smaller for School C.¹ Perhaps one person graduates without failure for every five who enter high school. This deplorable condition will be discussed at greater length in a later chapter.

¹ The general situation is well summarized in a recent examination of official figures:

"A study of school statistics of the city of Montreal proper for a period of 8 years shows that, calculating the entire school attendance, actually only 21.33 per cent of those entering the last year of elementary school continue far enough to register at the beginning of the XIth year High School, or 31.10 per cent of those beginning high school register for the XIth year..... There are, however, sufficient indications to show clearly that a greater percentage of Jewish pupils enter high school and that of those who do enter a greater number remain for a longer period." (From "Vocational Guidance", a chapter from the *Report of the Canadian Jewish Congress: Survey of Jewish Education in Montreal and Neighbouring Municipalities*. Compiled by Hyman Neamton, 1937)

When account is taken of the number of pupils who leave school after commencing Grade XI and those who fail on these examinations, it is clear that we may conclude that about 20 per cent of boys and girls commencing high school graduate without failure. The percentage among Jewish youths will be somewhat higher than this, among Gentiles somewhat lower.

Chapter 12

Intelligence Tests as Guidance Aids.

Results so far presented show that intelligence-test scores differentiate the better Grade VII students from the poorer ones. Furthermore the younger ones in a given grade make intelligence-test scores higher than the older ones. Account was taken of this important age difference of the students in Grade VIII by using the intelligence quotient (I.Q.) as the measure of this ability. Students in the Latin Course on this basis showed up as superior to those in the Science and Commercial ones while those in the General Course tended to be inferior. Pursuing this factor, it needs to be asked whether these differences are accentuated or diminished as students progress through the grades? Put in another form, are different degrees of intelligence required for successful completion of each of the advanced grades as well as of courses?

Evidently considerable selection takes place between Grade VIII and Grade IX¹. From 18 to 28 per cent of the pupils, depending upon the group, who dropped behind had I.Q.'s above the average of those who completed Grade IX. ("Completion of Grade IX" means that the Grade IX examinations were written two years after the student entered Grade VIII; these latter examinations may have been passed or failed). Selection was greater in the Science than in the other courses. Only 18 per cent of the 1931 class who did not complete two years of school in this course had I.Q.'s above the average of those who did. The 50 boys who left the group had an average I.Q. of 100, while the 57 who completed the two years had an average of 108. This was identical with the result found for boys who completed the first two years of the Arts course. The boys who dropped out of the Arts course in this period were somewhat superior to those leaving Science: their average I.Q. was 106. A similar selection occurred among students commencing Grade VIII in 1932. The boys who left the Science course (74) had an average I.Q. of 99; those who completed the two years (67) showed an average I.Q. of 106. This was somewhat below the 110 average of the successful Arts course students.

In sum, there is a distinct tendency for the differences between the Arts and Science students to disappear. Students with low I.Q.'s tend to fail in both groups. There were more of these in the Science group, consequently there was greater mortality among these students. A similar selection occurred in the Commercial course. Only 24 per cent of the students who commenced Grade VIII in September 1932 with I.Q.'s above 108 dropped behind before completing Grade IX in June 1934; 108 was the average for those completing the two years. Thus at the end of Grade IX there are only slight differences in the intelligence level of all three groups.

These differences decrease still further in the senior years. Thirty-eight boys who commenced the Arts course and 25 who commenced the Science course in 1931 completed Grade X in three years after entering Grade VIII. The average I.Q. was 111 for the former group. Seventy-one per cent of these boys had originally ranked in the top half of their Grade VIII class while 60 per cent were superior to the average boy who completed Grade IX. The Science students who completed Grade X had an average I.Q. of 108, i.e., the same as those who completed Grade IX. Sixty per cent of them were above the groups original average. No information at the Grade X level is available for other groups, though Grade XI (school-leaving) results were known in several instances.

Twenty-seven Arts students graduated in 1935, four years after entering Grade VIII. Their average I.Q. was 114. Seven had I.Q.'s

¹ Table IX, Appendix.

below the average of the original Grade VIII class; the remainder were above the median of those completing Grade X. Thus only seven boys with I.Q.'s of below 111 graduated. Sixty-eight of the original 116 Arts students in Grade VIII had I.Q.'s below 111. Thus only ten boys in 100 who completed the grade had I.Q.'s below this figure; 42 in 100 with I.Q.'s above 111 graduated. Boys who entered School A in September 1932 were also followed through the four years. The average I.Q. was 115 for the 27 of 170 Arts students who graduated. Six had I.Q.'s below 110 which was the average of those completing Grade IX. Thus seven in every hundred boys with I.Q.'s below 111 graduated as opposed to 25 in every hundred with I.Q.'s above 110.

Very few students graduated from the Science course in four years—only ten of the 108 who commenced in 1931 and 11 of the 142 who commenced in 1932. But average I.Q.'s were in both cases 113. Fifteen of these 21 students had I.Q.'s of above 108 as compared with 92 of the original 250 boys. Thus sixteen out of a hundred graduated if they had intelligence quotients of above 108, while four out of every hundred graduated who had I.Q.'s below 108.

A few students took advantage of their right to transfer from the Arts to the Science course when they entered Grade X. Eleven boys who commenced high school in 1931 with an average I.Q. of 109 made this transfer; only one of these had an I.Q. above 111. Five of these boys graduated in 1935. Their I.Q.'s ranged from 106 to 124, with a median of 113. These data are so meagre that no generalizations are warranted.

A certain amount of information is available concerning boys who commenced School A courses in September 1933. Fifty-four of 316 students graduated with an average I.Q. of 117. The original group included 168 boys with I.Q.'s below 110; only five of these graduated, i.e., three in every hundred. Thirty-three students in every hundred with I.Q.'s of above 110 were completely successful.

By the end of Grade IX the differences in intelligence between the Commercial and Arts Groups had decreased considerably. Many factors may cause a commercial student to leave school. He may have, or think he has, the skills necessary to secure and hold a position as typist, stenographer or bookkeeper. But there is evidence to indicate that intelligence plays a rôle in commercial school success. The average I.Q. of the pupils commencing their commercial course in 1932 was 103. Twenty-seven of them, with an average I.Q. of 95, did not complete Grade VIII. Only five of these 27 boys had I.Q.'s above 103; only three of them had I.Q.'s above 108. No information is available concerning the Grade X progress of commercial students. However, seven of the 121 who entered School C in September 1932 graduated in June 1936. They had an average I.Q. of 114 (including two with intelligence quotients of below 108).

A limited amount of information is available on the intelligence of the students in the General Course. Thirteen boys who commenced Grade VIII in 1931 transferred to the General Course prior to writing their Grade IX examinations. Their average I.Q. was 101. Seven did not continue into Grade X, but eight new transfers brought the total in the course up to 14. Their average I.Q. was 107, practically the same as that for students who completed three years in the Arts and Science divisions. None of these students, however, graduated four years after they entered high school. Nor did any of the students who entered the Grade VIII General Course in September 1933.

Certain general conclusions can be drawn from the data in this chapter:

(1) Considerable selection takes place during the progress of a pupil through high school. This is associated positively with intelligence quotients secured by means of group tests. If the samples measured herein are representative, the chances are slight of a pupil graduating from any course without failure if he has an I.Q. of under

110. Only seven out of a hundred of these may graduate. From 16 to 42 per cent of pupils with intelligence quotients above 110 can be expected to graduate. The higher percentages are found among pupils in the Arts or "Latin" course.

(2) The occasional pupil with a low intelligence quotient manages to graduate. There are three possible explanations for this. (a) These boys, although lacking intelligence and rapid learning-power, may have exceptionally good habits of study or be very proficient at "cramming" (b) They may not have taken the test seriously or were indisposed when examined; in either case they did not do their best work on the examination. (c) If of foreign extraction they may have been under a real language handicap. Possibly more than one explanation is applicable to some cases. The number of low scores among successful students is extremely small, and does not deserve too much attention.

(3) Approximately the same degree of intelligence is required for success in each of the four courses of study. There were differences in the intellectual levels of Grade VIII pupils following the various courses. But these differences had diminished by the end of Grade IX and they had in effect disappeared altogether by the end of Grade XI. The average pupil completing each course had an I.Q. of at least 113.

Chapter 13

Achievement Tests as Guidance Aids.

To what extent does achievement in school subjects at one date as measured by appropriate tests provide an indication of later high school success or failure? With this question in mind the sections of the New Stanford Achievement Tests relating to reading, dictation, language usage, literature and arithmetic were administered to the Grade VIII students in School A who graduated from high school in 1935. They were given the American Council Beta French Tests when in Grade IX. Some Grade VIII students who entered School C in 1932 were given the New Stanford Achievement Tests and followed through Grade IX. Separate consideration is accorded to marks on the reading and arithmetic sections of the New Stanford Achievement Tests, to the average of all tests given in this battery,¹ and to the American Council Beta French Test scores. The data are limited to those secured in School A except for a brief consideration of School C averages on the New Stanford Achievement Test battery.

Reading.

The average reading test scores of Grade VIII pupils were 102 in the Arts division and 98 in the Science one. Those who completed Grade IX in the former course still had an average of 102 although that for pupils leaving was 100. The average was 100 for Science students who completed the Grade IX and 97 for those dropping out. This indicates that Arts course pupils failed or passed almost irrespective of ability and achievement in reading. A limited amount of selection took place among Science students. Actually 40 per cent of the Arts students who dropped out obtained scores above 103, i.e., the median of those completing Grade IX; while 35 per cent of the Science class who dropped out had scores as high as 100; i.e., the median of those who completed Grade IX.

When comparisons are made at the Grade X level selection is again observed among the Science students and not among Arts pupils.² There was a change of two points in the average score of Arts pupils who completed Grade X. This was raised from 102 to 104. Forty-four per cent of the boys who dropped out prior to writing these examinations had reading test scores higher than the average of those who completed the three years. Consequently the difference has no practical significance.

Definite selection occurred among the Science students. Fifty per cent of these students who completed Grade X had scores of 106 or over; this is seven points above the average of the original Grade VIII group and 8 points above the average of students who dropped out. Only 27 per cent of those who dropped out scored above 106. The difference of eight points in test scores between successful and unsuccessful Science students is significant. This corresponds to a full year in educational age development.

A few students who entered high school in 1931 and were given this test graduated in 1935 from their original course. The average score was 104 for boys completing the Arts course, while the median was 109 for the ten successful Science students.

Eleven boys transferred from the Arts to the Science divisions of the matriculation course when they entered Grade X. They had passed the Grade IX examinations but did not care to continue the study of

¹ Tables X1 and X11, Appendix.

² Table X111, Appendix.

Latin. Their reading test scores were slightly below the average of pupils who continued in the Arts course and only four of the eleven scored above the average for Grade X Science students. Five of the eleven lads graduated four years after they commenced high school, with an average score of 106. This is 5 points above the average of those who first transferred, and is further evidence that the New Stanford Reading Tests have selective value among pupils who elect the Science Course. There is no evidence that this conclusion applies to those who elect the Arts Course.

A few boys transferred to the General Course prior to Grade X. Their average was 103 on the reading test. This indicates little or no selection. Not one of these 15 boys graduated from Grade XI in 1935. This complete failure, irrespective of their test scores, indicates that factors other than reading ability may have been predominant.

There is a significant change in status of Arts and Science Groups over this four year period. The Arts pupils had definitely superior test scores in the beginning. The picture had changed four years later. The graduating Science students have a median score 5.5 points above that of those matriculating in Latin. There was little indication throughout the four years that pupils deficient in reading ability tended to fail if they entered the Arts matriculation course. Greater reading ability, however, was necessary for success in the Science course. This may seem unexpected, though it is possible that the study of Latin is more mechanical than is often assumed. Otherwise no reason seems to account for the fact that the study of mathematics and science should require greater reading ability than the study of Latin.

The lack of correspondence between school success and reaching test scores among Arts students is sustained by an examination of their statistical agreement. There was practically no agreement when test scores were compared with Grade VIII marks ($r = .25$). Somewhat higher agreement was observed in the case of Science students ($r = .43$).

Arithmetic

The New Stanford Arithmetic Examination scores are an average of two tests: one of computation, the other of problems. The average score was 105 for Arts students tested in 1931-32. Commercial students had the same average while Science pupils were inferior with an average of 99.

The 75 Arts students who completed Grade IX in two years had an average of 103 although 50 per cent of them had received scores of 106 or over. Two in every five of the thirty-four boys who dropped out had scores of at least 106. The average was also 103 for the 54 Science pupils who completed Grade IX. This was 4 points above their original average. Only fourteen per cent of those who dropped out had arithmetic test scores above 104. Science students leaving their course were clearly inferior to Arts ones on this test.

This comparison of Science and Arts students at the end of Grade IX indicates a close similarity in arithmetic test scores. The averages are identical although more Arts students obtained marks above the average. The real difference in scores which was observed in Grade VIII had disappeared. The fact that Science students weak in arithmetic dropped quickly out of their course accounts for this

This tendency for pupils with a poor foundation in arithmetic to fail after they have entered high school is still more clearly apparent when we examine the records of those who completed Grade X. The numbers are considerably reduced in size as there are only thirty-nine

boys in the Arts group and twenty-one in the Science group. Both have averages of 106. Fifty per cent of students in both had scores of above 108.

The arithmetic test has greater selective value in application to the Science students. Only ten per cent of those who dropped out had obtained arithmetic test scores of above 108 as contrasted with an overlapping of 30 per cent among the Arts students. Exactly the same amount of Grade VIII achievement in arithmetic is necessary for three years of success in the two courses.

Ten students completed the Science course in four years with a median arithmetic score of 109.5. Only two had scores of below 108. None ranked in the poorest half of the original Grade VIII entrance class. Test scores were not as high for the 27 students completing the Arts course in four years. Their median of 108 had not changed from Grade X. Thus there was no selection among Arts pupils in Grade XI.

Nine boys transferred from the Arts to the Science Course at the beginning of Grade X. They had a median score of 107; one point below the medians for students continuing in the Arts or Science Courses. Five of these graduated. Their median score was 106. Two were inferior to the Grade VIII average.

Twelve pupils, who transferred to the General Course were given the New Stanford Arithmetic Tests. Their median score was 102, i.e., six points below that for youths completing Grade X in either Arts or Science courses. Only one had an arithmetic test score above 108. None graduated in 1935.

The New Stanford Arithmetic Tests have greater diagnostic value than the reading tests. This is confirmed by an examination of the coefficients of correlation between arithmetic test scores and school marks. The test scores of Science pupils agree more closely with the average Grade VIII marks than they do with their arithmetic marks. The correlations referring to the Science Group are slightly higher than those for the Arts one. There was definitely less agreement in the case of the Commercial group.

Averages on the New Stanford Achievement Tests.

The average used here is based upon the two reading and the two arithmetic tests and examinations in spelling, language usage and literature.

The Grade VIII Arts students showed an average of 100 (median 101), the Science students one of 96 (median 98), while the Commercial class had an average of 98 (median 99). Students commencing the latter course a year later were also tested in Grade VIII. These had an average of 96. Thus, in Grade VIII the Arts students were definitely superior to the other groups.

This battery of seven tests was not as valuable in differentiating successful from unsuccessful pupils over a two year period as the arithmetic tests alone. In fact fifty-three per cent of the Arts students who dropped behind obtained higher marks on this battery than the average for pupils who continued in school. There was, however, a certain amount of segregation in both the Science and the Commercial groups where only twenty-two and thirty-eight per cent respectively of those dropping out obtained scores higher than the average of those who continued.

The differences in composition of the Arts, Science and Commercial groups almost disappear by the end of Grade IX. The median score obtained by the pupils completing each of the three courses is 100. Unfortunately the Commercial Group is small and could not be followed for more than the two years. But the available data indicate that the same original achievement at the beginning of Grade VIII is necessary

for success in the Commercial as in the Arts and Sciences Courses of study.

Brief consideration may be given to the Grade X and Grade XI success of students given all seven New Stanford Tests. A summarization of the progress of these is a repetition of statements concerning selection on the basis of the arithmetic tests. At the end of Grade X ten of the twenty Science students had scores of at least 105 while 50 per cent of the Arts pupils had scores no higher than 103. Those who transferred to the Science Course at the beginning of Grade X had a median New Stanford average of 100. This was also the median for those who transferred to the General Course. One boy in the Science Course graduated with an average New Stanford mark below 98 while nine of the twenty-six graduating Arts students had averages below 101.

The seven New Stanford Achievement Tests provide measures of greater value in the prognosis of school success than the reading sections of the New Stanford Tests but have less value than the arithmetic tests. The coefficients of correlation between the New Stanford Achievement Tests averages and school marks are almost identical with those obtained between school marks and the arithmetic tests. The remaining sections of the New Stanford Achievement Tests added little or nothing to its prognostic value.

French (American Council Beta)

We have already seen that French marks given in school agree closely from year to year. The student who ranks low in Grade VIII has little chance of improving his comparative standing in Grade IX or X. The American Council Beta French Test was administered in November 1932 to all pupils in Grades VIII and IX classes of School A, and the tests revealed the following.

A correlation coefficient of .74 was secured between Grade VIII marks in written French and scores of Grade IX students on the American Council Beta French Test. The schools, however, place emphasis upon the oral aspects of French. The coefficient of correlation was .65 between the total marks in oral and written French and the test scores of 171 students.

The American Council Beta French Test taken alone, differentiated successful from unsuccessful students in much the manner as the New Stanford Achievement Tests. Grade VIII students obtained an average score of 108. Those who completed Grade IX in the Arts Course had a median score of 127 as compared with 105 for those who dropped out. Only 22 per cent of the latter obtained scores above 127. Science students who completed the two years had an average of 121 while 26 per cent of those who dropped out prior to the Grade IX examinations had scores above this.

As would be expected scores are higher for the boys who were given this examination in Grade IX. There was, however, a marked difference between the Arts and Science Groups. Those of the former who completed Grade IX had a median score of 147, the latter of 131. The average score of Arts students was not raised between Grade IX and X although only 31 per cent of those who dropped out prior to these had scores above 147. The average score of Science students was raised from 131 to 137 in the same period, 32 per cent of those who dropped out had scores above this Grade X average.

Twenty-eight Arts students completed Grade XI in 1935. Their average was 159; only 8 had scores below 147. That may be shown in another manner. Forty-two of the boys tested in Grade IX had scores below 147. Eight of these, or 20 per cent graduated. There were 20 graduates from the forty-two Grade IX students with scores above 147. The ten science students who graduated in 1935 had an average of 144.5 including two scores of under 137.

¹ For details see Tables XIV and XV, Appendix.

Nothing is known of the Grade X standing of the boys given the American Council Beta French Test in Grade VIII. The thirty 1936 graduates had an average score of 137. Forty-nine Arts students who completed Grade IX had scores of less than 127. Nine of these graduated. This includes only four who ranked in the poorer half of the Grade VIII class. The ten Science students who graduated in 1936 had an average score of 129.5. Only one had scored below 118.

The averages for Arts students on this test were slightly above those for Science students. These differences were consistent but they have little significance because of the great range of scores. The test selects those students who will be successful in either courses with fair accuracy.

Summary.

Of the four different tests in this chapter, two are designed to measure skills in individual subjects: arithmetic and French. These proved to have the greatest value in selecting successful high school students in the Arts and Science Courses. The reading test differentiated successful from unsuccessful students in the Science section but not in the Arts division. This, together with the tests of spelling, language usage and literature which were included with the arithmetic average to determine the general score on the New Stanford Achievement Tests, decreased the value of the arithmetic examination.

The weakness of this section of the enquiry is that little information is available concerning the Commercial Course, the number of cases here being insufficient to draw general conclusions. The evidence adduced, however, supports that of the preceding chapter. It indicates that the differences between Grade VIII students following the optional courses are not maintained. Arts and Science students who graduated in four years had equal achievement on the arithmetic test and on general average of the New Stanford Examination. The Arts Group was slightly superior on the American Council Beta French examination. The reading test did not differentiate these boys but it had prognostic value when given to the Science Group. Apparently the Commercial students require New Stanford Achievement Test scores of the same magnitude as the matriculation classes. Students in the General Course were somewhat inferior. But as none of these graduated it may be concluded that they too must have achievement equal to that for the other courses.

Chapter 14

The Results of Prognostic Tests.

The review of the distribution of test scores and other psychological characteristics in Section II does not refer to the prognostic tests included in this study. This was because these were not used with a view to measuring the distribution of either abilities or achievements. Their purpose was to examine the value of prognostic tests in predicting success in school subjects which had not been studied.

Evaluation of a Latin Prognostic Test.

The Orleans-Solomon Latin Prognostic Tests were given to School A pupils commencing to study Latin in September 1932. The validity of this examination rests in the degree to which it can forecast success in Latin. This, however, is only one subject and, irrespective of the mark secured in it, failure in others will force a student to repeat his grade. Therefore the usefulness of the test will depend also upon the accuracy with which attainment in the high school Arts Course as a whole can be predicted.

The Orleans-Solomon Latin Prognostic Test scores do not prove valid, at least for Montreal schools. The coefficient of correlation was $.53 \pm .05$ between scores and Grade VIII Latin marks. The correlation with Grade IX Latin marks was $.39 \pm .07$. While these correlations show real agreement they are not sufficiently high to have practical value.

Table 7. Vertical Results of the Orleans-Solomon Latin Prognostic Test

Group	No.	Mean	Md.	S.D.
Completed Grade IX Arts course	77	121	117	38.0
Did not complete Grade IX Arts course	54	86	80*	35.7
a. Left before Grade VIII examinations	12	118	117	44.6
b. Changed to General course	8	71	69	18.8
c. Did not take Grade IX examinations in Latin or General course	34	78	76	27.8

*The "overlap", or percentage leaving the Latin course who scored above the median of those completing two years, was 18 per cent.

The examination's usefulness is not necessarily limited by this lack of validity. It may still predict general school success. Consequently it was evaluated in the same manner as the intelligence and school achievement tests. Pupils were followed through two years at school and a study made of the test scores of successful and unsuccessful pupils. This is shown in Table 7. Certain data are available in reference to students who graduated in 1936.

A median score of 100 was obtained by the students given the examination. Seventy-seven boys who wrote the June 1934 Grade IX examinations had a median score of 117. Only 33 per cent of the original Grade VIII class obtained scores as high as this.

Some students dropped the study of Latin before the end of Grade

VIII. They were in no way inferior to those who completed the two years. The median was 117 in both cases. There is a simple explanation for this. The Latin test was given on the third day of the school year. Some students entered the Arts Course but later changed schools or courses.

Eight boys transferred at the end of Grade VIII to the General Course. Their median score of 69 was the lowest average obtained for any section of the class. Each of these boys probably transferred rather than repeat Grade VIII.

Seven of 34 boys who did not complete Grade IX had Grade VIII averages of under 50. Their scores on the Latin test ranged from 31 to 89. Eighteen boys with Grade VIII marks from 50 to 60 had a median test score of 80 with an absolute range of 41 to 121.

Nine other boys did not complete Grade IX. Eight of these had Grade VIII school marks ranging from 63 to 68 and test scores varying from 44 to 139.

Not all boys passed who completed Grade IX. Twelve definitely failed; i.e., they had average school marks of under 60 per cent. Their test scores averaged 103 although they varied from 88 to 149.¹ Nine additional students may not have passed as their averages were between 60 and 64.9. Their median score was 103 with marks ranging from 52 to 107. The remaining 56 boys who wrote the Grade IX examinations passed. They had an average of 138 with scores ranging from 89 to 176. Only two of the 21 boys with average school marks below 65 had test scores above 138.

The twenty-two lads who graduated in 1936 had a median test score of 135. Only two were below the Grade VIII average of 100. None scored below 95 and only seven received scores below 117 which was the average for pupils completing Grade IX. The pupils who passed their Grade IX examinations had an average of 138, which is three points above that for the high school graduates. Thus the test does not segregate successful from unsuccessful students beyond Grade IX.

The Orleans-Solomon Latin Prognostic Tests cannot be used to predict school marks in Latin over a one year interval. It is more important, however, that general school success in the Arts course be predicted. The test will do this over a two year but not a four year period.

Prognosis in Geometry.

All School A matriculation pupils commence to study geometry in Grade IX. They were given the Orleans Geometry Prognostic Test in September 1932 to determine its selective value. It predicted geometry marks over a one year period in a satisfactory manner. The correlation coefficient was $.70 \pm .03$ between test scores and Grade IX geometry marks.

The scores ranged from 10 to 183; with a median of 75. Half the group had marks ranging from 57 to 97. A consideration of test scores together with the distribution of geometry school marks indicated:

(1) One out of every five pupils who ranked among the highest 25 per cent on the test failed in geometry.

(2) One in every four scoring above the median of 75 failed in geometry. To interpret this, account must be taken of the top 25 per cent. We then see that 40 per cent of the class who ranked between the 50th and 75th percentiles failed in geometry. Thus the prediction of success in geometry is only slightly better than chance for pupils with scores between 75 and 97.

¹ This and other figures in reference to score ranges is from the 10th to 90th percentile.

(3) Seventy-five per cent of the students failed who had test scores below 57.

(4) The Orleans Geometry Prognostic Test was of little value in predicting the success or failure of students ranking between the 25th and 50th percentiles as 40 per cent passed their examinations.

Accurate prognosis of a student's success in geometry can be made 75 or 80 times in a hundred over one year period if he ranked on the test in the highest or lowest 25 per cent of the class. Prediction is only slightly superior chance where pupils ranked in the middle 50 per cent (i.e., have test scores of 57 to 97).

The Orleans Geometry Prognostic Test did not predict geometry marks over a two year period. A correlation coefficient of $.17 \pm .08$ was secured between test scores and Grade X marks in elementary geometry and of $.39 \pm .11$ between test scores and Grade X marks in advanced geometry. Neither of these are statistically reliable.

It may be concluded that this test is of value when Grade IX geometry marks are to be predicted. However, its practical use is limited as this subject must be studied for three years.

Geometry is only one subject while promotion depends upon success in a number of subjects. Does the Orleans Geometry Prognostic Test differentiate pupils who pass from those who fail? Boys who completed Grade X in the Arts and Science Courses were compared with those who dropped out. Definite differences can be discerned in the selective value of the test in the two groups:

Table 8. Selective Value of the Orleans Geometry Prognostic Test.

Group	Status	No.	Mean	Md.	S.D.	Overlap*
Science	Completed X	25	82	75	29.3	50
	X not completed	42	74	75	25.8	
Latin	Completed X	44	89	88	22.5	28
	X not completed	28	69	70	27.9	

*See previous table.

The 25 boys who completed Grade X in the Science Course had a median score of 75. This is identical with that for boys who dropped out. However, the difference of eight points in the arithmetical averages indicate certain differences: students who left the course had very low scores. The test had no other selective value. Ten of these twenty-five students graduated in 1935. Their median score was 90 with a range from 56 to 138. The 15 boys who did not complete their course had an average of 72; the range was from 62 to 102. Only one boy with a score in the lowest 25 per cent of the original class graduated with the Science group in 1935.

The 41 Arts students who completed Grade X had an average of 88. This was 18 points above that of those who dropped out. Only 28 per cent of the latter scored above 88. The Orleans Geometry Prognostic Test, therefore, had greater value in predicting school success of Arts than of Science students over a two year period.

Grade XI examinations in 1935 were passed by 28 of the 41 Arts pupils who completed Grade X. Their median score was 92.5 with a range from 62 to 116. The median score of the 13 students who did not graduate was 82; the range was from 57 to 118. Four of these thirteen boys

had scores of above 92.5. Thus successful Grade XI graduates from the two courses have similar scores.

Ten boys, with a median score of 94, transferred from the Arts to the Science section of the class. This average is somewhat above that obtained by either Science or Arts students who continued in their original course. Four of these boys graduated in 1935, but only one had a score above 90.

The average score was 90 for all pupils successful in their school leaving examinations. This corresponds to the 67th percentile of the original Grade IX class tested. Less than ten per cent of the graduating students stood in the lowest 30 per cent of the Grade XI class when this was ranked according to test scores.

The Orleans Geometry Prognostic Test segregates Arts students who were successful in the second and third years of their four year course to a greater extent than it differentiates those in the Science Course. No differences of any significance can be observed in the scores of the Arts and Science pupils who were successful throughout their courses. Probably the same degree of the abilities measured by this test are necessary for success in the two courses.

The Prediction of Commercial Course Success.

Two examinations (called here Test M and Test N) were constructed and administered to students following the Commercial course. These tests were not standardized. The objective was to secure measures to differentiate the successful from unsuccessful students. Clerical Test M was administered in November 1932 to 480 School C Grade VIII and IX pupils. The following figures indicate that it satisfactorily differentiated students one year apart in school achievement.

Grade	No.	Median	Percentile Range*
VIII-1	218	102	71 - 126
VIII-2	106	107	80 - 126
IX-1	111	121	102 - 136
IX-2	45	125	108 - 136

*From 10th to 90th percentile.

Pupils in the "2" section of a grade were six months ahead of those in the "1" section. Large differences appear between average scores of students one year apart in school achievement. Less than 10 per cent of Grade IX pupils obtained marks as low as the median of the corresponding Grade VIII class. There was no differentiation of scores on the basis of sex and very little on the basis of age.

These data respecting Clerical Test M were believed to indicate that the examination would differentiate successful and unsuccessful Commercial pupils. Further study was restricted to those pupils who entered School C in September 1932. The coefficients of correlation were found between Test M scores and Grade VIII and Grade IX marks in each of the Commercial subjects. All were chance agreements. Thus the test did not prove satisfactory in predicting marks over a period of one or two years.

However, scores were subjected to further examination by comparing students who completed Grade IX with those who did not. Thirty-six pupils who completed Grade IX had an average score of 106.6 (median 104.3) while the 45 who did not complete the grade had an average of 100.7 (median 102.8). Forty-four per cent of the latter had scores above 104. Nine of these students graduated from high school in 1936.

Their median score was 120. Only two had scores of below 104. These data are very meagre, but they appear to indicate that considerable selection did occur between the second and fourth years of high school.

Finally, Test N was given to pupils in Grade VII. A number of these entered the Commercial course in School C. It was found at the end of Grade VIII that this test did not differentiate the superior from the poor student.

Chapter 15

The Predictive Value of Grade VII School Marks.

The same elementary school leaving examinations are written by practically all pupils entering a given secondary school in September. We have seen that these marks taken as a whole differentiate pupils entering the various high school courses in much the same way as psychological test scores. Since they are given before the pupil enters high school, they are not dependent upon the teaching, marking or promotion system of any particular secondary school. Moreover, most of the pupils entering Schools A, B and C in the present sample studies had graduated from the same elementary schools. This independence of Grade VII marks from many factors which effect those received in high school makes possible an evaluation of (elementary) "school-leaving" marks for the prediction of high school success.

Marks obtained in the last grade of elementary school were secured for all the pupils at School A, B and C who wrote Grade VIII examinations in June 1932 and June 1933. The semi-annual promotional system in Schools B and C affects the distribution of marks secured for students in these schools as data are not available for those who failed in January. Most of the data in this study refers to School A.¹ Therefore we will deal first with the Grade VII results of those who entered this institution.

The Arts group which entered School A in September 1931 had an average Grade VII mark of 80.3. Seventy-one of these boys completed Grade IX with an average mark of 80.8. Thus there was practically no change in the crude average. But only twenty-three per cent of those who dropped out had marks above the median (81.1) for successful Grade IX students. Further selection appeared when pupils who completed Grade X were compared with those who did not. Only 17 per cent of the latter had Grade VII marks above the median (83.0) of the former. The twenty-four boys who completed the Arts course in four years had an average Grade VII mark of 84. Only two pupils had Grade VII marks of below 80 while the total range was from 75 to 92.

The School progress was similar for boys who commenced the Arts Course in 1932. The selection was somewhat greater at the Grade IX level as only 5 per cent of students not completing the grade had Grade VII marks above the median (80.9) for those who did complete it. Information is not available respecting the Grade X marks of these pupils. However 30 students with a median mark of 85.5 completed Grade XI in four years. Their Grade VII marks range from 76 to 93; four of these were below 80.

The number of boys entering the Arts Course during these two years (1931-2) was 240. Six graduated who had school marks of from 75 to 80. A Grade VII average mark of 65 is sufficient to permit entrance to this course. Yet no boy who received an average mark of from 65 to 75 graduated.

Science students entering Grade VIII were inferior to Arts ones. This was indicated by Grade VII marks as well as by psychological test scores. The difference in averages was 3.2 marks for students in the 1931-32 Grade VIII class. This was reduced to 1.2 marks at the end of Grade IX, but had increased to 2.6 marks at the end of Grade X. Seven boys completed the Science course in 4 years with the median mark of 87. The range was from 76 to 93 with only one below 80. These Grade VII marks are almost identical with those for successful Arts students. The difference was 2.7 marks for students entering School A in September 1932. This was maintained through Grade IX. Data respecting Grade X marks are not available for these lads. Eight graduated from

¹ Table XVIII, Appendix.

high school in four years with a median Grade VII marks of 79. The range was from 73 to 88. These figures are somewhat lower than the corresponding ones for Arts students.

A few students who entered School A in 1931 transferred to the General Course. Ten Arts and nine Science students did this at the commencement of Grade IX. Their median Grade VII marks were 71 and 73 respectively as compared with medians of 81 and 75 respectively for those continuing their original courses. Thus there is a real selection of students transferring from the Arts to the General Course. Pupils entering the General Course had Grade VII marks definitely inferior to those of the successful Arts students. None of the General students graduated.

Grade VII marks segregate successful and unsuccessful students in School A in any one year in the same manner as psychological test scores. Those pupils who were successful in high school received high marks in the seventh year. This selection is carried forward from year to year. Only one of 481 boys graduated from Grade XI in 4 years with a Grade VII mark of under 75. Elsewhere it was shown that 70 per cent of the 500 Grade VII pupils who were examined obtained marks of less than 76.1. Only 20 per cent of these Grade VII students secured marks above 79.7. Practically all boys who graduated from School A in 4 years had Grade VII marks of above 80. Thus graduates were drawn from the best 20 per cent of the elementary school scholars. One hundred of the five hundred Grade VII pupils failed. The remaining 400 were entitled to enter the Arts or Science courses. But only one hundred of these students had a reasonable expectancy of being successful in high school.

The selective showing of Grade VII marks in the matriculation course of School B is similar to that in School A. Forty-four pupils who commenced Grade VIII in 1931 completed Grade X with an average Grade VII mark of 84.5 (median 86.1). The forty-one students who had dropped out of the course had an average mark of 80.9 (median 81.0). Only 6.1 per cent of the latter students had Grade VII marks above the median of the former.

Twenty-seven boys graduated from School B in 1935 having completed their matriculation course in four years. Their median Grade VII mark was 88.8 with averages ranging from 75.1 to 94.0. One pupil was below 80 per cent while eight were above 90 per cent.

The Grade VII marks of students who entered the matriculation course of School B in 1932 show similar selection. Fifty-four boys completed Grade IX and twenty-nine left the group following completion of Grade VIII. The average Grade VII mark of the former was 81.6, of the latter 75.8. The corresponding medians were 82.9 and 76.8. Only two individuals among those not completing Grade IX had Grade VII marks above the average of those completing the Grade. Twenty of these boys completed the matriculation course in four years. Their median Grade VII mark was 88.0. Marks ranged from 77 to 93. Nineteen girls who commenced secondary school at the same time completed Grade XI with a median mark of 85.5. Four of these 39 students had marks of below 80; one girl had an average of 73.

The progress of pupils who entered School C in 1932 was followed for two years. Thirty-six boys completed Grade IX in two years; 55 dropped out. The selective value of Grade VII marks is again indicated. The Grade VII average was 77.5 for those completing Grade IX; it was 73.6 for those who dropped out. The corresponding medians were 75.9 and 73.6. The mean for students completing Grade IX in School C was as high as that for those completing the corresponding grade of the Science Course in School A the same year. Grade VII marks available for only nine students in School C who completed the four years of the Commercial course without failure. The median for this small group is 86. Two are below 80, the lowest being 72.

Correlation coefficients will indicate the agreement between Grade VII marks and those secured at the end of Grade VIII, IX or X.¹ However, these do not show the true relationship between Grade VII and later marks. Secondary school marks have weaknesses because they are isolated to one school. But a particular difficulty is inherent in the use of coefficients of correlation to indicate the relationship between such sets of school marks. The distribution of one set has been curtailed as pupils with marks below certain arbitrary standards are refused admittance to the next higher grade. This lowers the coefficients of correlation. That is the coefficients secured show less relationship than actually exists between Grade VII marks and those secured in the higher grade. The curtailment is greater between Grade VII and Grade IX marks than between those for Grades VII and VIII owing to the selective effect of the latter marks. The limitations are even greater when the coefficients were obtained between Grade VII and Grade X marks.

All correlation coefficients were significant between Grade VII and later marks. Those between Grade VII and VIII marks were highest. They varied from .60 to .85. These extremes were both found in the School A class which commenced Grade VIII in 1932. The low agreement refers to the Science, the high to the Arts students. School B and C correlations varied from .64 to .74, those in School C were somewhat lower than the others. More data were available in reference to School A than the other institutions. Grade VII and VIII school marks were known for a total of 428 of these boys. Some entered the School in 1931, others in 1932; some were following the Arts, others the Science Course. The correlation coefficient was .74 when these data were combined.

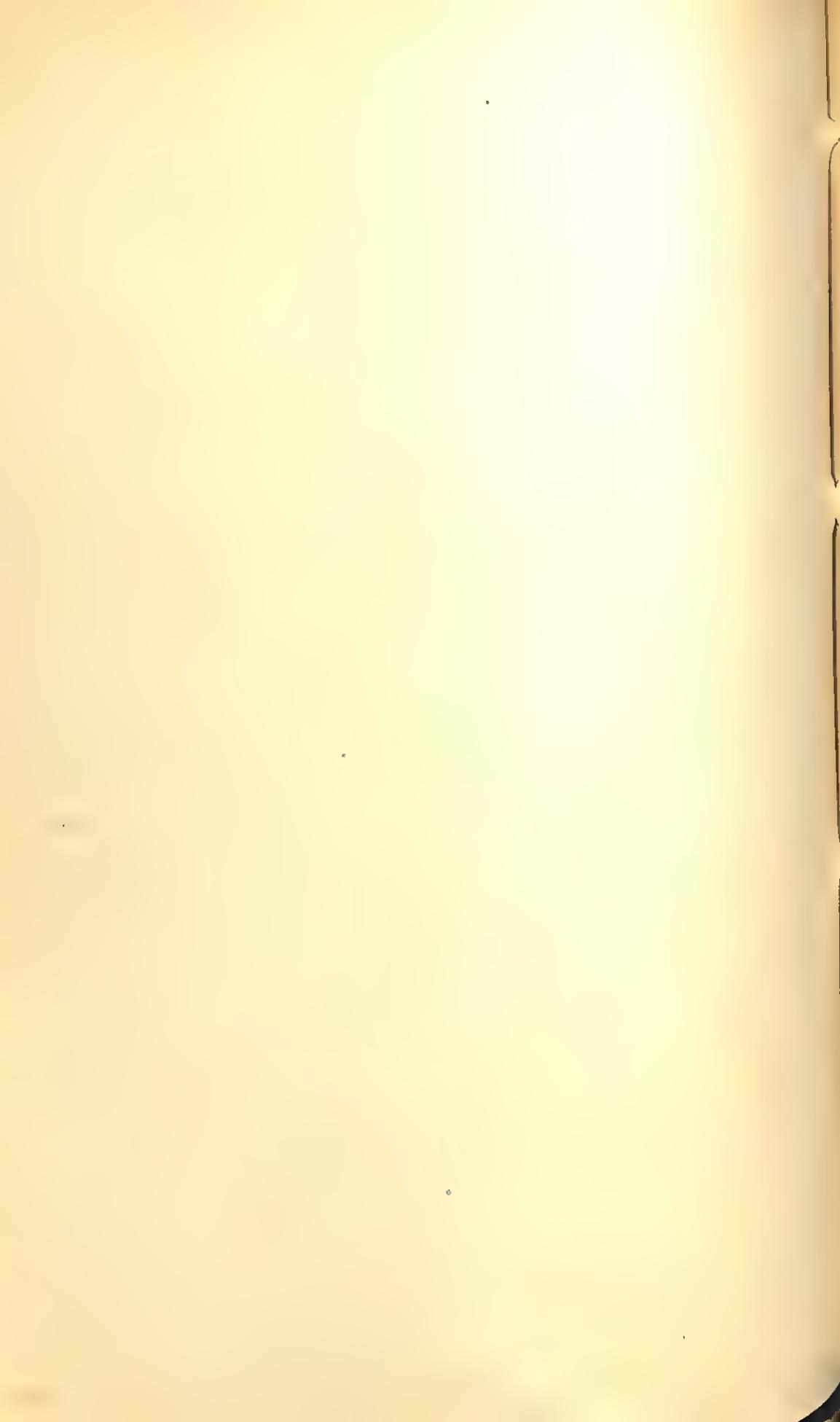
What is the effect of the curtailment of Grade VII marks on the correlations? The standard deviation of these for students who entered Grade VIII was 6.60 while it was 9.14 for the Grade VII students examined. This knowledge enables us to correct the coefficient found between the two sets of data. We need only assume that the dispersion of Grade VII marks for pupils tested in this grade is the same as it was for the two preceding years. We find on making this assumption that the true agreement is .84 between Grade VII and VIII marks. Thus the Grade VII marks had an efficiency of 46 per cent better than chance in the prediction of Grade VIII marks. There were not sufficient data to determine this for the other schools. But as the initial correlations are approximately the same as in School A, we may assume the existence of a similarly high efficiency of prediction.

There is considerable correspondence between Grade VII and Grade IX marks. Correlations range from .54 to .82. This is in spite of the fact that the distribution of Grade VII marks has been curtailed for two years: many boys with low marks did not pass into Grade VIII, some were not promoted to Grade IX. The correlations between Grade VII and X marks are somewhat lower than the others. The latter marks were known only for pupils in the Arts and Science divisions of the 1931 School A class and for the corresponding School B matriculation group. The observed correlations in the three instances were $.44 \pm .09$, $.57 \pm .10$, and $.61 \pm .07$.

These give further evidence of the rigidity of promotion in Montreal schools. The pupil with high Grade VII marks is able to secure high marks in subsequent grades. But the student with a Grade VII mark of under 75 has almost no chance of succeeding. Even those with marks of under 80 have poor chances. The average marks of those who do pass from grade to grade, however, can be predicted from Grade VII results with fair accuracy.



Part IV
THE INDIVIDUAL STUDENT



Chapter 16

Individual Differences.

The previous chapters have surveyed the progress through high school of various groups. It has been observed that comparatively few pupils dropped behind in school who had abilities and achievements above the average of successful ones. The differences between students commencing the various courses disappeared as we plotted the progress of successful students. The survey referred to groups; results were expressed in terms of percentages. So far nothing has been said of the individual pupil. Yet he is the important unit. Guidance, whether toward an education or a vocation must deal primarily with the individual. Surveys such as the present one are necessary preliminaries for such guidance. But in themselves, they are not sufficient.

Most of the data have been limited to test scores, school marks and grades completed. These do not permit elaborate case studies which, in any case, would not be justified. For all our findings concerning promotion indicate that this rigid school system permits little development - or for that matter deterioration - of the student once he has entered secondary school. Promotion or failure occurs mechanically. There may be a few exceptions to this, but how frequent are these? The full story is not known, but only one instance was found in over 650 records in four years of a boy who graduated after starting with a Grade VII mark below 75 per cent. So far at least as they follow present curricula, therefore, pupils do not improve academically as they go through school.

Does it necessarily follow, however, that this holds true for the individual boy? Some sample enquiries were made to test this out. Interviews were held with the parents of forty-one School A students whose school records were available (examined in the preceding chapters). Roughly half were parents of pupils who commenced the Arts Course and half parents of Science students. All boys were in the School A Grade VIII classes which opened in September 1931; and each followed the course he commenced until graduation or failure.

Individual "profiles" were prepared to show the comparative standing of each boy on the different psychological and achievement tests (Fig. 5). A profile of test scores can take one of several forms, but any graphical method of presentation is a profile if it indicates how one boy compares with others. One consideration guided the preparation of the profiles: while the psychological tests differentiate successful students, yet their prognostic values were not great enough to permit the prediction of exact marks. The profiles indicate whether a boy's marks are above or below "critical scores". The analyses detailed in preceding chapters show that certain scores differentiate successful from unsuccessful students. The averages obtained by boys completing a grade are particularly significant. Only from 15 to 40 per cent (depending on the tests and on the group) of those who leave their classes without completing Grade IX had scores above the average for boys completing this grade. The average scores obtained by students who completed the ninth grade have therefore been accepted as "critical scores". This arrangement, while arbitrary, is consistent and can readily be used to secure a dividing line for any test.

The ratings secured by each of the 44 boys on all tests were compared with the critical scores. If a boy's mark was below the critical one for students following his course of study, a cross was placed in the appropriate square on the profile. Absence from school when a test was given is indicated by a dash. Fig. 5 shows the completed profiles for the 44 boys and it includes two additional types of information: the grade the boy finished, and his marks on his final examinations. This presents the most significant information for a sample of pupils, showing individual differences in a concise form.

**DISTRIBUTION OF TEST SCORES AND EDUCATIONAL STATUS
IN RELATION TO CRITICAL SCORES**

GROUP A-I LATIN STUDENTS								GROUP A-I SCIENCE STUDENTS										
Code	Education		Test						Code	Education		Test						
	Grade	Mark	1	2	3	4	5	6		Grade	Mark	1	2	3	4	5	6	7
000	XI	601	—	—	—	—	—	—	301	XI	756	—	—	—	—	—	—	—
007	XI	651	—	—	—	X	—	—	302	XI	830	—	—	X	X	—	—	—
013	XI	710	—	—	—	—	—	—	309	XI	819	—	—	—	—	—	—	—
033	XI	623	X	X	—	—	X	X	310	XI	759	—	—	—	—	—	—	—
040	XI	628	—	—	—	X	X	X	311	XI	753	—	—	—	—	—	—	—
005	X	70	—	—	—	—	—	X	303	X	62	X	—	X	X	—	X	—
036	X	71	—	—	X	X	—	—	304	X	70	X	—	—	X	—	—	—
101	X	56	X	X	X	X	X	X	306	X	60	—	—	—	X	X	—	—
129	X	--	X	—	X	—	—	—	316	X	65	X	—	X	—	—	—	—
105	IX	53	X	X	X	X	X	X	320	X	--	—	—	—	—	—	X	—
106	IX	55	X	—	X	X	—	X	324	X	56	—	X	X	—	X	X	X
111	IX	62	X	—	X	—	—	—	400	IX	59	X	—	X	—	—	X	—
122	IX	65	—	X	X	—	X	X	401	IX	50	—	X	X	—	X	—	—
123	IX	54	X	X	X	X	X	X	403	IX	65	—	—	X	X	—	X	—
124	IX	57	X	X	X	—	X	X	408	IX	77	—	—	—	X	—	—	—
202	IX	F	X	—	X	—	X	X	410	IX	57	X	X	X	X	—	—	—
219	VIII	72	—	—	—	—	—	—	417	IX	66	X	X	X	X	—	X	—
									418	IX	71	X	—	—	X	—	X	—
									423	IX	50	X	X	X	X	X	X	X
									428	IX	72	—	—	—	—	—	—	—
									503	VIII	69	—	X	X	—	X	—	X
									516	VIII	60	X	X	X	X	—	—	X
									522	VIII	63	X	X	—	X	X	—	—
									527	VIII	80	X	—	—	—	X	—	—
									530	VIII	57	X	—	—	X	X	—	X
									532	VIII	63	X	X	—	X	X	—	X
									533	VIII	62	X	—	X	X	—	—	X

Test		Critical Score	
		Latin	Science
1. I.Q. (Otis)		111	108
2. New Stanford Average		100	100
3. American Council Meta French		147	131
4. Reading Average		103	102
5. Arithmetic Average		106	104
6. Geometry Prognostic		88	75
7. Grade VII Average Marks		81	78

Fig. 5. Distribution of test scores and educational status in relation to critical scores for two main groups of high school students.

The outstanding feature shown by the chart is the fact that no boy who failed in either Grade VIII or IX stood above the critical scores on more than two of the seven measures. However, two boys (Numbers 101 and 303) completed Grade X although they had low marks in all but one of the tests for which they were present. It is interesting to note in both cases that the high mark was the Grade VII average. An examination of their records indicates that special circumstances affected both. Pupil 101 had spent a year in Grade VIII when this investigation commenced. He failed and repeated this grade and was included with the boys who commenced Grade VIII in 1931. Thus he took four years to complete the three years of high school work. Actually he failed in Grade X, and therefore required five years to secure promotion to the fourth year of high school. In Grade IX his work was fairly satisfactory but near the margin (average 68.6). He disliked school and developed a growing antipathy toward it. In one sense this was flatly unreasonable, for he day-dreamed considerably about his future success in occupations requiring university training. His mother reported that his feelings were very sensitive, that he had few friends and did not mix well with other boys. It cannot be said that his poor school work was responsible for this unsatisfactory personality development. Certainly, however, his school work did not improve his social and personal adjustments. In judging his scores, it must be remembered that he was repeating Grade VIII when the tests were given and was disinterested in school. Perhaps he did not cooperate with the examiner any better than with his teachers. In any case, his poor school work was reflected in his test scores. The low scores on the psychological tests discount his satisfactory Grade VII mark. This is a good instance of the value of taking account of both psychological test data and school marks in predicting later school achievement.

Pupil 303 is another example of a boy who secured marks above the critical scores only in his Grade VII examinations. His school record was good in Grades VII, VIII, and IX. He failed Grade X French, elementary and advanced algebra and advanced geometry. Throughout high school he realized that his continuation at school depended upon his promotion. This desire for promotion was a very definite incentive. But it was not sufficiently strong to overcome the handicap of initially low intellectual ability, poor achievement in French, weak reading skills and lack of facility on the geometrical prognostic test. Unfortunately, he was absent when two of the other tests were given.

A rather different case is that of Pupil 324. While no pupil who failed Grades VIII and IX had marks above the critical score on more than two tests, this boy completed Grade X before he failed and dropped out. He rated above the critical level on the intelligence and reading tests. He had been promoted from Grade IX in spite of his actual failure in this grade, obtaining here an average of 63.5 with marks below 60 per cent in three subjects. This boy had the intellectual ability but not the knowledge to justify his taking a matriculation course in Montreal. His was an instance in which lack of interest may have played a rôle. He wanted to be an electrician; his parents wanted him to go to university, and insisted that he should try. It is hard to say which came first - his lack of scholastic interests or his poor school achievement. But he was, in any case, a misfit in the matriculation course.

Pupil Number 33 deserves special consideration. He completed high school in four years although only three of his seven marks were above the critical scores. This is the only true exception in the sample to the rule that school success can be predicted through these critical scores. His school marks were high throughout the secondary school. His mother described him as "a model boy, who worked hard at school". His industry at school, in fact, compensated for his intellectual or other deficiencies. He was "a model boy" in the sense that he was very quiet, inclined to withdraw within himself, and made few friends. School success was achieved but at the expense of a well-developed social personality.

Pupil 40 graduated although he had secured low marks on three of the seven tests. This was a hard working lad who was promoted from grade to grade with conditions. He did not pass either his Grade IX or Grade X examinations. Presumably this is another instance of hard work and an interest in school compensating for a lack of the particular aptitudes usually necessary for success in the Montreal schools.

No other pupil with only one, two, or three low scores failed in the last grade attempted. Taken as a whole, this is a convincing indication of the prognostic value of these tests. There is only one qualification in the individual case, namely, that certain personal qualities which may be summed up by the phrase "hard work and interest" may in some cases compensate for comparative weakness in ability and general achievement.

The general conclusion is even more important. Is the school curriculum, its choices and methods of promotion, sufficiently flexible? The assessor who places a high value on order and regularity may find this rigidity of the school system an admirable quality. Yet no "pupil-centred" curriculum would impose such an impossible task upon the scholar. If more boys and girls of the teen ages were going to secondary-grade schools, modification of the courses would be incapable. Enlightened public opinion everywhere insists that every child should have the opportunity to attend secondary school. Most provinces have compulsory school-attendance laws which compel the child to attend at least one or two years of the high school. There is no such compulsory education in Quebec. If there were, it would be impossible to maintain the rigidity of the system at high and academic levels with its major presumption that high school is preparation for the university. In other words, the school system would have to provide courses of study which would benefit the "average" pupil. An examination of the critical scores we have been using shows pretty definitely that it does not do so today.

Seventy-five per cent of the general population have Otis I.Q.'s below 108. A New Stanford Achievement Test average of 100 corresponds to an educational grade of nine years and seven months. New Stanford Reading and Arithmetic critical scores for Montreal Grade VIII pupils were above the grade ten level of achievement. Only 24 per cent of Grade VII students have marks above 78. Thus it is clear that these critical scores bar the great majority of school students. Such high standards could not be maintained in a school system which offered an education to a wider range of average and medium-grade boys.

These statements may be considered unfair. The boys we have been considering were all following the matriculation courses of study. Perhaps they should be superior to average. But we have already seen that the remaining courses require the same initial abilities and achievements. While critical scores show lower for all the Science students, this course is substantially the same, and equally difficult.

Those Who Left School.

The critical scores have been demonstrated as adequate in selecting pupils who will be promoted annually. But it is obviously important to apply them to evaluate the educational potentialities of boys who left school to search for work. The group of unemployed boys who were examined were given the Otis (intelligence) and New Stanford (educational achievement) tests. A number of these boys (72) left school near the beginning of Grade VIII. This includes 39 who completed Grade VII, 16 who completed Grade VIII, and 17 who finished Grade IX. The position above or below the Science critical scores of each of these unemployed boys was found for four of the measurements - the Otis I.Q., the New Stanford Reading, Arithmetic and general averages.

Low I.Q.'s proved to be characteristic of the group. Sixty-seven out of seventy-one boys had I.Q.'s below 108, while 35 of these were below 94. One boy who left school on completion of Grade VII had an I.Q. above 108 as did three of those who completed Grade IX. These boys might have passed through high school successfully if they had continued. However, while only twenty-five per cent of the general population have I.Q.'s below 94, practically half of this group had I.Q.'s below 94.

The achievement scores registered by the unemployed boys were somewhat higher. All New Stanford tests were given to twelve of the sixteen boys who completed Grade VIII. Four of these had marks below all three Science critical scores, while seven were above all critical scores. Only three boys who completed Grade IX had any low scores. It must be remembered that the unemployed boys who completed Grade VIII had four to six months more schooling than the boys still at school who were given the examinations. Those who completed Grade IX had a year and a half more schooling. Twenty-two of the thirty who completed Grade VII and who were given all the New Stanford tests were low on one or more of the three sections.

How are these scores to be evaluated? First, it is clear that boys with generally inferior scores may be considered unsuitable educational material in the Montreal high schools, while those with generally high scores are fair educational risks. The 35 boys with I.Q.'s below 94 might include a few individuals who did poor work because of extraneous factors. But most of these youths would probably receive but slight educational benefit from the high school curriculum. Those who showed I.Q.'s below 108 and yet had satisfactory scores on three sections of the New Stanford Achievement Tests might be expected to have a fair chance. Strict adherence to this criterion would mean that eight of the thirty boys who left school on completion of Grade VII should have continued into high school. This number can be increased to 13 if we include any students with two test results above the critical scores. When as much latitude is allowed as possible, the fact remains that fifty per cent of those who left school at the end of Grade VII did not have a reasonable chance of benefiting from high school training.

It is quite clear that if their returning to school is in question, the kind of classes provided for boys who have been out of school for some time must be differently conceived from the present established courses. The students in the sample who had two or more high scores may or may not have benefited from school had an opportunity presented itself for them to return to the classrooms. These boys had left school atmosphere: they were out of work and seeking employment. Their habits and attitudes toward school and study inevitably changed in such circumstances. Some or all of them, moreover, had suffered some personality deterioration resulting from unemployment. Probably very few could have adjusted themselves to a school environment of exactly the same kind that they left.

Chapter 17

Pupil Guidance in Practice.

Proper interpretation of the scores registered on a limited number of psychological tests cannot be made without knowledge of a boy's social and educational background. A mere increase in the number of tests is not an adequate substitute for an interview. Fortunately, it was possible to carry forward with one group a detailed examination which was very illuminating. For part of the period of the study, a vocational guidance bureau was established as a practical laboratory for testing the factors related to school success and to occupational achievement or failure. During the summer of 1934 this was made available as a free clinic to the first 80 boys to apply who had completed high school in Greater Montreal that June. This limit was reached within ten days, and a number of later applications had to be refused. Detailed psychological examinations were completed by all but seven of these eighty boys, all of whom had passed successfully through the educational machine which we have been considering. All were now faced with the necessity of finding work, or else entering upon further study either at university or in vocational fields.

It was arranged that for each boy an application had to be signed by the parent, who was sent a comprehensive questionnaire for this purpose. When complete, this outlined the boy's educational, social and medical history, and presented a picture of his personality, interests and habits as these appeared in the home. Parents, without exception, co-operated well and this questionnaire was found exceedingly useful.

The psychological examination of the boys was divided into two sections. Groups of ten boys at a time were given tests of intelligence, clerical ability and two-dimensional form relations (Minnesota Paper Form Board). Each boy also completed two questionnaires designed to throw light upon personality adjustments. A few days later each was given an individual examination requiring from one to one and a half hours. At this time a mechanical assembly test was also given. Test results were discussed with the boy, a review made of his personal adjustments, and all available data were interpreted to him in terms of vocations. A written report to the parents completed the examination. At the conclusion of this project, a circular letter was sent to each of the parents asking their co-operation in evaluating and improving the service.¹ They were requested to complete a short questionnaire giving an opinion of the psychological examination and an estimate of its value in the case of their son.²

Thus there are three aspects to this branch of the enquiry: the personality analysis of the boys, the recommendations made, and the follow-up study. These are dealt with separately before considering statistically the factors affecting school success as measured herein.

Personality Analysis.

Emphasis was laid in earlier chapters on the importance of the home situation in the development of personality. The likes and dislikes, the preferences and prejudices, even the worries and cares of the parents tend to be passed along to the children. Almost any kind of information throwing light on the home background of the family is helpful, but the most pertinent facts are those which refer to the attitude of the parents toward the children themselves, the school

¹Partly as a result of the response to this letter, the Psychological Institute was organized in Montreal in 1936 to provide a regular service of psychological consultations.

²Replies were secured from 46 of the 67 parents: parents numbered less than 73 as several pairs of brothers were examined.

system, social strata, and occupational fields. None of these attitudes can be expressed numerically, but account was taken of them in making recommendations. The questionnaire completed by the parents provided much of the information; the balance was secured incidentally and unobtrusively from the boy in the course of the examination.

The different interests and personality characteristics of the boys were not segregated into "bits" and examined atomistically or numerically. Rather a probing search was made at the interview for tendencies which would benefit or harm the examinee. Several cues aided this appraisal. The questionnaires completed by the boys asked such questions as "Are you troubled with shyness?", "Do you like organizing activities?", "Are you sociable or solitary?", "Are you industrious or lazy?", etc. The answers formed the basis for the interview: but this in the boy's own reasons for the statements made were sought, i.e., the things which led him to consider himself shy, industrious, lazy, etc. Furthermore, his statement of his personal qualities and interests were compared with those made by his parents, and this furnished insight into the home situation.

The quality of secondary school work was assessed from statements made by the boy and by his parents. Since all the boys were completing comparable high school courses, and had just written the same examinations, these had a value they would otherwise have lacked.

The psychological tests used provided information not only concerning the boy's abilities, but also his habits of working. Thus the clerical test indicated whether the boy tended to work slowly or rapidly, to be careless in arriving at solutions, or to be slow in grasping directions though satisfactory thereafter.¹ The mechanical assembly test was a valuable tool in diagnosing manual dexterity, clumsiness, antipathy toward mechanical work, etc.

Thus the psychological tests and the interview were co-ordinated to provide a complete picture of the personality development of the boy. Recommendations were made on this basis toward occupations or further study.

The Recommendations Made.

Every man and woman lives in a world bounded by definite limits. Social and economic barriers are by no means the least important of these. Vocational guidance must recognize these social and economic factors and recommendations cannot be satisfactory if they ignore this reality.

The English-speaking minority in Montreal is distributed through many strata in the occupational world. Four out of five of these boys' parents were in professional, technical or clerical positions, or some responsible post in business or commerce; the remainder were in skilled trades. This considerably limited the scope of occupations which would be regarded as socially and economically suitable for the group. Accordingly, only four recommendations did not endorse careers which can be broadly defined as professional, commercial, or clerical. Recommendations were made toward such occupations as accountancy, engineering, medicine, law, teaching, office work, commercial selling and a few specialized industrial careers. In many cases the immediate problem was whether a university course should be taken before the boy entered the business world.

The extent to which the recommendations agreed with suggestions of the boys and their parents can be seen from the figures below. They show that the psychologist agreed with one of the suggestions from either the boys or their parents in only about half of the cases. Disagreement with the views of one or the other was necessary in

¹ The tests would have had even greater diagnostic value had they been given individually.

Recommendation	Number of cases
Report in agreement with wishes of boy and parent	14
Report in agreement with wishes of boy; opposed to parents	6
Report in agreement with wishes of boy; parents views unknown	7
Report in agreement with parents' wishes; opposed to boys views	8
Sub-total	35
Report opposed to boys' views; parents' wishes unknown	14
Report opposed to parents views; boy undecided	3
Report opposed to suggestions of both boy and parents	18
No suggestions on part of either boy or parents	1
Report made no recommendations	2
Total	73

forty-nine cases. In thirty-six cases, the principal recommendation originated at the interview. (No satisfactory conclusions could be reached in two reports owing to a lack of co-operation from the boys concerned). It is apparent that vocational guidance was not a "rubber-stamping" of the boys' or his parent's wishes, although social and economic factors determined the boundaries within which recommendations were made. Further evidence that vocational guidance does not consist of giving psychological tests and interpreting their scores in a mechanical manner is also brought out in the following data on the causes for disagreement with suggested careers.

Principal cause for disagreement	Number of boys	parents
Insufficient ability to succeed at proposed work	16	9
Insufficient scope in the work to allow ability to manifest itself	1	1
General temperamental tendency unsuited to proposed work	6	8
Personality factors a detriment to success in proposed work	8	4
Lack of interest on part of boy	0	2
Lack of opportunity in proposed work	7	3
Poor financial condition of family	2	0

In somewhat less than half the cases the principal cause for opposing the suggestions of either the examinee or his parents could not be expressed in quantitative terms. But in none was the "wholeness" of the individual sacrificed to fit a pattern of measured psychological abilities. Where the problem was "should the boy attend university?" the judgment was based on a composite of psychological test scores, attitudes, previous academic history, and habits or work. Intellectual superiority was rated as of secondary importance in comparison with these other factors.¹

The Follow-up.

What happened to these reports and recommendations? Were they thrown aside and forgotten as impractical, or were they acted upon? The service was a free one. Possibly the bureau was used sometimes as a method of keeping the boy occupied for a few days. But the follow-up study conducted six months after the interviews indicates that the great majority of parents were satisfied with the examinations and that a considerable percentage acted in accordance with the recommendations.

¹ Very limited data are available concerning the careers of the boys. The following figures indicate highly satisfactory recommendations over a limited period of time, for a small sample of 25 boys who entered McGill University in 1934.

	First University Standing			Failed
	Passed	Conditioned		
University was recommended	13	2		1
University was not recommended	1	4		4

The questions sent the parents, together with their responses are reproduced below.

1. Are you satisfied that the report from our Bureau was worth the time taken in completing the questionnaire sent you and the time of your son in attending the examination?

Yes	42
No	2
Satisfied as a study only	1
No answer	1

2. Was the report of definite value in arriving at a decision regarding your son's immediate future?

Yes	27
No	9
Questionable	4
No decision made as yet	3
No answer	3

3. To what extent were the recommendations in the report followed?

Entirely	12
In part only	19
Not at all	6
Unclassifiable answers	3
No answer	6

There is no reason to believe the twenty-one parents who did not reply were more dissatisfied than those who did. Answers were received from some who were expected to disagree strongly with the recommendations made; they were not received from others who had written personal letters expressing appreciation. Further those questionnaires expressing dissatisfaction were among the first received.

Parents were also invited to send in comments on the service which had been supplied their sons. A few typical samples from these notes are given as illustration of the general attitude toward the examinations.

"Your vocational guidance service is most helpful to any boy leaving school or college". Report was considered of value and followed entirely.

"I believe that the vocational guidance service would be of greater value in more prosperous times...." Report was followed in part although regarded of no definite value in reaching a decision regarding a career.

"....industry is demanding today....a university degree.... It indicates a certain intensive period of training in which the student is taught the art of study...." Satisfied with the report as an interesting study, but recommendations not followed.

"The report was very helpful in furthering understanding of my son's attitudes and abilities. Also in planning a career that would help him in gaining confidence, a more open make-up and a happier outlook. He is very busy and happier than he has been since he was a small boy...." Followed recommendations entirely.

Such impressions were secured from about half the parents who returned the questionnaire. Replies *in toto* varied from a definite refusal to consider the report, to very enthusiastic comments. A number made reference to the fact that the service would be of greater value in more normal times, i.e., when employment is easier to obtain.

Success in High School.

The comprehensiveness of these examinations and their significance to the individuals examined has been shown. But what light do they throw upon the main body of this study? Have they contributed to our knowledge of the factors involved in school success?

Each of the 73 boys had succeeded in high school if by this is meant completion of the high school grades. Some graduated four years after entering Grade VIII; others six years later. To what extent do test scores indicate comparative school success? How much importance should be given to other factors?

The figures below show the distribution of scores obtained by the group on the four tests administered.

Test	No.	Mean	Median	S.D.
Otis S-A Tests of Mental Ability	73	54.3	56.1	8.4
N.I.I.P. Clerical Test	73	82.2	81.5	17.0
Minnesota Paper Form Board	73	32.1	32.3	7.8
Mechanical Assembly Test	69	80.3	85.4	14.5

The median score on the Otis intelligence test indicates that fifty per cent of the boys examined had I.Q.'s above 114. Thus the group are definitely superior in this respect to the boys examined in Grade VIII. Their performance is also a superior one on the Minnesota Paper Form Board.¹ Comparisons cannot be made with other groups for the two remaining tests.

However, we are not concerned with the average scores of the high school graduates. The important question is whether these tests segregate those who really have academic ability. This is answered through a classification of the boys into the four following divisions:

- (1) Boys who completed their secondary school course in four years, then entered McGill University and were successful during their first year (14 boys). These definitely had academic ability.
- (2) Boys who entered McGill University following the psychological examinations, failed or were "conditioned" on the basis of their first year work at McGill. These boys did not have the academic ability of those in Class 1, yet had sufficient to gain entrance to university.
- (3) Boys who repeated any grade in high school (16 boys, including three in Class 2 but none in Class 1). These boys were inferior academically to the others.
- (4) The remaining 35 boys concerning whose academic ability nothing is known apart from their examination results and the fact that they had repeated no grades. This group was discarded from further consideration.

Every boy in Class 1 has demonstrated that he possesses academic ability. Do they have higher test scores than those in Classes 2 and 3, each of whom have demonstrated certain weaknesses in writing examinations? Marks of each adolescent were compared with "critical" scores, the average scores of all boys in Class 1 being arbitrarily used for this purpose. The percentage of boys in each of the three groups who had marks below these critical ones indicate very definite differences. Students successful in the first year of their Arts

¹ Grade VIII pupils in School A had an average score of 23 on this test. Twenty-five per cent scored above 28. As the test was not closely linked to school work, it has not been given consideration in this study.

DISTRIBUTION OF TEST SCORES OF HIGH SCHOOL GRADUATES ACCORDING TO EDUCATIONAL STATUS

Boys successful in First Year University				
Code	1	2	3	4
1A	X	X		
1B				X
1C				X
1D				
1E				
1F	X	X	X	X
1G			X	X
1H		X	X	X
1I	X			
1J		X	X	
1K				X
1L	X	X		
1M				
1N	X	X	X	

Boys not successful in First Year University				
Code	1	2	3	4
2A	X			
2B	X	X	X	X
2C	X	X	X	X
2D	X	X	X	
2E	X	X	X	
2F	X	X	X	
2G	X	X		
2H				X
2I	X		X	X
2J	X	X	X	
2K	X	X		

Test	Critical Score
1. N-IIP: Clerical	93.3
2. I.Q. (Otis)	57.8
3. Paper Form Board	34.4
4. Mechanical Assembly	85.5

Boys who repeated one or two grades in high school				
Code	1	2	3	4
3A	X	X	X	X
3B	X	X	X	X
3C			X	-
3D			X	X
3E	X	X	X	X
3F	X	X	X	X
3G	X	X	X	X
3H	X			X
3I	X	X	X	
3J	X	X	X	
2I	X		X	X
2B	X	X	X	X
3K	X	X	X	-
3L	X	X	X	X
2E	X	X	X	
3M	X	X	X	

Fig. 6. Distribution of test scores of high school graduates according to educational status, distinguishing between successful and non-successful students.

Test	Otis	Clerical	Paper Form Board	Mechanical Assembly
Mean	57.8	93.3	34.4	85.5
Percentage of successful students below the mean (Class 1)	43	43	36	36
Percentage of pupils attempting university but not successful in first year (Class 2)	73	91	64	50
Percentage of students repeating grade who were below the mean. (Class 3)	87	93	87	71

course had higher marks than those in the two remaining groups. The Mechanical Assembly test was the only one of the four measures which did not clearly differentiate students in accordance with their known academic ability. The clerical examination, the intelligence test and the paper form board showed selective value in the order mentioned.

A more detailed examination of these figures can be made from the individual profiles in Figure 6. This was constructed by assigning a code number to each boy and placing a cross in the appropriate square every time he scored below the critical marks. Half the boys in Class 1 would be expected to score below these critical scores. Considering the data, test by test, we see:

(1) While nine of the fourteen boys with successful high school and first year college records scored above 93.3 on the clerical examination, this was true of only one boy who failed or was conditioned during his first year at college, and two who repeated any high school grades.

(2) Eight boys in Class 1 had intelligent test scores above 57.8. Only six individuals in Classes 2 and 3 (i.e., out of 24) had scores this high.

(3) The paper form board test did not differentiate groups as well as the other two examinations. Nevertheless only five boys in Classes 2 and 3 together gained marks of over 34.4.

(4) The mechanical assembly test did not differentiate successful college students from unsuccessful ones, but it tended to segregate those who failed in high school. Only four of these fourteen boys had marks above 85.5. However, as this test differs radically in content from academic work no further reference will be made to it.

(5) Five boys in Class 1 obtained high scores on all three tests, as compared with only one in Class 2 and none in Class 3.

How much significance has the I.Q. in differentiating boys in these three classes? It has been shown elsewhere that high school graduates are above the Grade VIII average in "general intelligence". But are those with academic ability superior to others in this sense? It would appear so. Only two boys in Class 1 had I.Q.'s below 108; the remaining 12 above 111. The percentage of low I.Q.'s is greater among students lacking academic ability: six of the eleven boys in Class 2 had I.Q.'s below 108, as had nine from Class 3.

This summary indicates both that critical scores can be selected which differentiate successful from unsuccessful students and that exceptions occur where scores are not sufficient for prognosis. Exceptional cases in Class 1 are those with low scores on the three tests; in Classes 2 and 3 where high scores were obtained on two or more tests.

Some Individual Cases.

Student 1F is a definite exception to statements concerning the value of critical scores. He made a very poor performance on the clerical test (62), the Otis (30) and the paper form board (26). He completed his first year university without failures although he had a bare pass mark on the Matriculation examinations. However he had never failed a grade in high school (he lost almost one half year through sickness), and he carried an extra matriculation subject (chemistry) for which classes were held during the noon hour. At the psychological examination his work was both slow and inaccurate. He studied hard, had few friends, and was very dependent upon his brother. He appeared to be a definite introvert, but this may have been due to excessive sensitiveness. He objected to dancing and taught Sunday School classes in a Mission Church. On the basis of the traits and background measured, it was not possible to account for his previous (or future) educational achievement.

Student 1N also had scores below the critical ones on all three tests. His score of 57 on the test of intelligence was just below the critical one; on the clerical test (79) and the paper form board (30) he rated somewhat lower. Certain circumstances were present, however, which would tend to lower his scores. He was a very ambitious Jewish boy who had taken scholarships in every grade through high school. At the time of the examination he was aged sixteen when examined, he had a most unfavourable emotional disposition toward McGill University where he had just been refused admittance (although his application was accepted later). But even apart from a consideration of test scores, his personality and general work habits indicated by previous school records were such as to rate him as a good educational risk.

None of the remaining twelve boys in Class 1 had three scores below the critical ones. Low scores on one or two of the tests may be accepted as normal.¹

Student 2H was the only example of a boy not successful at university who obtained high scores on all three tests. This boy had an excellent high school record, gaining for three of the four grades and making an excellent matriculation examination mark. The university subjects he failed in are not known, but he reported dissatisfaction with his course at the beginning of the second term, although his parents were satisfied with his work. He was in conflict with his parents, however, on the subject of religion (Jewish), and this emotional disturbance may have been a symptom of underlying conflicts which marred his adjustment to the university environment.

Student 2A secured a low score only on the clerical test (75). Scores on the Otis test (50) and on the paper form board (36) were satisfactory. He had not repeated any grades in high school, but followed an irregular school curriculum which did not lead to university matriculation. The home situation was far from conducive to study; the boy had to look after the house, prepare meals, etc. Emotionally he was very unstable; he was unable to concentrate attention on a problem, and work found difficult was not attempted. This had resulted in his dropping the study of Latin and refusing to attempt the Advanced Mathematics in the high school course. The same tendency was observed at the psychological examination in his refusal to attempt problems that could not be completed readily. A consideration of his environmental conditions and his emotional handicaps in conjunction with the test scores led clearly to the expectation that he would have difficulty with a university course.

In Class 3 no student had marks above the critical scores on all three tests. Three, however, had low marks on only one of the three.

Students 3C and 3D were brothers, whose scores on each of the three

¹ Owing to the method of selecting critical scores.

tests differed by one mark only. Both had repeated Grades IX and X of high school and both failed the matriculation examinations. Their work is reported to have been very satisfactory in elementary school and to have been average in Grade VIII. During their first two years at secondary school their home environment changed considerably for the worse. The father's business failed and antagonism between father and mother disrupted the home. Both boys became abnormally sensitive in reference to the home situation. This combination of adverse environmental factors which coincided with the deterioration in school work may be regarded as the primary cause of their failure.

Boy 3H is the only other exceptional case in Class 3. He repeated a grade on account of poor health and an operation which necessitated four to five months absence from school. Strictly therefore, he does not constitute an exception to the use of critical scores in differentiating successful and unsuccessful pupils. Had it not been for this unfortunate illness his would have been uniformly good.

Pupil 21 is an instance of a boy who repeated a grade in high school and obtained scores above the critical ones on some of the three tests. He is not in fact an exception to the use of critical scores, but rather an excellent example of the selective value of such marks. No grade was failed in high school but Grade X was repeated at his own request as he did not believe the work had been mastered. Consequently he does not rightly belong in Class 3. As he had low marks on two of the three tests a mechanical interpretation of his results in terms of critical scores would have indicated his failure in the first year of university. However, as he was very conscientious and a "hard worker" it was recommended that he commence studying for a degree. In spite of these favourable qualifications he did not secure a clear promotion to Second Year. His prognostication as inferior academic material was justified.

The application of arbitrarily chosen critical scores to known facts concerning high school graduates emphasized two points. First, pupils who demonstrate scholastic ability generally obtain higher marks on psychological tests than do those with poorer school records. Caution is always needed, but at least individual prognosis with an adequate background of data appears well justified. The results of the present small sample substantiate the conclusions reached from data on pupils still within high school, discussed previously. Secondly exceptional cases are important: they demand attention because critical scores are here not necessarily indicative of academic progress. A sufficiently comprehensive examination of the personality, emotional development, habits, interests, and home background will identify these cases.

Part V
CONCLUSIONS



Broadening the School System.

Shed of its details, the picture which has here been surveyed is not a happy one. Hundreds of young adolescents enter high school with high hopes of securing university entrance, then fall by the wayside one after another. They are rejected by an educational system which graduates only about thirty of every hundred boys and girls fed into it. Some of these thirty are battered and scarred as "partial failures"; physically they may be well, but their habits have been disorganized, their personalities warped through the repetition of grades. None were found among these "partial failures" who had escaped from Grade XI sufficiently unscathed to pass their first year university examinations with flying colours. Undoubtedly there are some examples to the contrary, but none within the samples of this study. Of course, one of every five students does graduate without failure; but it is reasonable to question seriously whether this is a satisfactory state of affairs.

Official educational statistics brand Montreal secondary education as a machine which is not catering properly for the "average pupil." Perhaps in such circumstances it was almost a forlorn hope to discern a possible basis for guidance for those at present passing - or trying to pass - through the grades. But in other respects, the search was justified, and the conclusions are clear. They may be disconcerting to some and denied by others. The evidence is meagre at many individual points, but, brought together, it is overwhelming enough to constitute an indictment. Reference will be made later to these faults of the system as a whole, but an evaluation of certain specific matters is first necessary.

A major question of the investigation was: can satisfactory educational guidance be given to pupils entering Grade VIII? It was found that pupils of their own accord chose courses which segregated them into groups forming a hierarchy of abilities and achievements. This was noted first in Grade VII where the "better" students desired the Latin or Arts matriculation course, while the "poorest" students wished to leave school. No definite conclusion could be drawn from an examination of these seventh grade students, for less than half had any notion of the secondary school courses they wished to follow. Those who did know at first frequently changed their minds later. A need for educational information at the seventh grade is clearly evident.

Are Present Groupings Satisfactory?

How can such information best be given? Can pupils be differentiated in a manner sufficiently accurate to warrant their choosing one rather than another course? They can certainly be differentiated into groups. In fact this is already done in large measure. Those who elect the Latin option are on the average superior in academic ability to those who elect a science or commercial course. Both of these groups are superior to those following the general course. There are important exceptions to this general statement: pupils are found in every course who are the equivalent of the best and poorest in any other course. It would be pleasant to believe that at least these know what they want, but the weight of evidence is against such a conclusion. Many of them are not in the group which best represents their mental attainments.

Intelligence tests, standardized educational tests, and school examination marks are in harmony in indicating the general superiority of boys choosing the Latin option, compared with others. There is evidence that convenience of school location and fear or dislike of Latin are among the main factors which lead to the selection of the general

science or commercial course - not an aptitude for science or commerce. Pressure from the school tends to determine who will enter the general course, but this is a Cinderella among the courses at present. If it were reorganized and more attractive, this would be an important improvement.

We may be certain of one thing. Whatever the reasons for choosing one course of study in Grade VIII rather than another, the final choice will be unsuitable for the majority.¹ The less "academic" the abilities and achievements of pupils commencing a course, the larger will be the percentage of failures. All courses offered in Montreal schools require identically similar initial abilities and achievements in students. Some attract those who lack these requirements, and such courses have particularly high percentages of failures.

Of what value then is educational information given in the seventh grade? Its value is questionable. Information concerning the content of high school courses would probably do little to make intelligible the choice of a high school curriculum. It might have value by showing pupils the occupational fields which are barred to them - or whose entrance is made difficult. Even this is problematical. Prejudices, likes, and antipathies are undoubtedly built up in the mind of the boy at elementary school toward many subjects of the high school curriculum. Talks would not affect their emotional attitudes. A junior high school, however, where an introductory set of secondary school subjects was taught to all pupils at an earlier age would undoubtedly provide effective educational experience. If pupils studied for two or three years some Latin, some general science, a commercial subject and any further options, they would have sufficient information upon which to base a choice of senior high school course. Even the examination marks might be more significant. But any less radical plan would be largely ineffective.

The value of such a junior high school course or other guidance at the commencement of high school may be conceded, but no guidance plan can be effective if serious modifications are not made in the optional courses of study. Otherwise it is simply a pleasant illusion to talk of selecting one course as better than another, when no more than two pupils in ten graduate without having to repeat grades. Repetition of grades is harmful to the individual. It kills incentive and interest and develops a sense of failure in the boy before he encounters the obstacles of the adult world. Effective guidance of boys and girls at the high school stage must be postponed until such times as it is no longer necessary for eight out of every ten to leave their courses or repeat grades.

One type of educational guidance would have a certain limited value. This guidance could recognize the impracticality of the present course of study, but could accept the desire of parents for their children to secure a maximum of secondary school education, whatever it might or might not lead to. This would be based entirely upon "common sense" direction of pupils. Only pupils ranking in the top twenty-five or thirty per cent of an "average" Grade VII class would be encouraged to commence a matriculation course. Those who "give the impression" that they might fit into office work would be encouraged to take the commercial course. The study of Latin would be recommended to all students preparing for matriculation who were uncertain whether they wanted a B.Sc. or a B.A. university degree. Any who seemed likely to fail in Latin would be advised to take the alternative subject general science. Pupils not fitting into any of

¹ See "Ability and Opportunity in English Education" by J.L. Gray and Pearl Moshinsky, in *Political Arithmetic* (ed. Lancelot Hogben, Allen and Unwin, London, 1938) Chapter VIII. Many of the critical observations of this study are not applicable to the Canadian situation. However, the authors note that even in England, where scholarships are more plentiful, education either is not adapted or not available to large percentages of pupils capable of benefiting from study.

these categories could take the general course or leave the public educational system and enter a trade course. The financial condition of the family would have to be taken into account in making recommendations. Unless a reconstructed financial and scholarship system is to be built up, poor parents would have to be discouraged from starting their children on courses which could not be completed, and which would have no practical value without further expensive training. Those whose parents wished to continue additional training for them although their limit had been reached in the present secondary school course, would be advised to commence less academic courses.

Such "common-sense" could do no harm and would in many instances do good. A short consultation with principal or teacher might be sufficient to help many parents start their children on a course which will do a minimum of harm. It cannot be said, however, that such guidance will ensure that the high school does a maximum of good for pupils. Any course is bad if the average pupil, or a large proportion of the class, must repeat grades. The sense of failure instilled in the growing boy or girl more than offsets his better knowledge of Latin, English, mathematics, etc. So long as no more than twenty per cent of pupils entering high school can graduate, almost every course will be harmful to many.

Qualifications.

It must be remembered that the evidence reviewed here relates only to Montreal schools, and to certain age groups. Psychological and educational tests and school records were examined for nearly three thousand boys and girls, but these were predominantly Grade VII and VIII students. They represented three schools offering commercial, general, and matriculation courses, the latter with two divisions. These schools were selected in consultation with the school authorities, and the pupils were reasonably typical of our present secondary school population.

Further, the progressive hierarchy which was clearly discernible when class averages were compared is relative, not absolute. All criteria indicated that students electing the Latin or Arts matriculation course were superior in general to those commencing other courses, not that the latter were unsuitable for secondary education in any form. There were slight differences between the average Science and Commercial pupils which favoured the latter group. Pupils electing the General Course tended to be inferior to others, in the same sense. And in each course individual students were found who would be matched with the best and poorest in each of the other courses. Care must therefore be taken in interpreting the reference to "inferior" students. Every group given psychological tests was superior on the average to comparable groups of American school children. Grade VIII in Montreal tended to be about one year advanced in academic work over corresponding American classes when examined by American tests. Thus school courses taken by "inferior" students are in fact attended by pupils of above average calibre.

Nevertheless the hierarchy exists. Why? There are no clear-cut interests in school subjects, vocational ambitions, or working conditions which differentiate the groups sufficiently to account for the actual differences. The selection is actually determined by the attitude towards Latin, the desire for a "practical" course, the practice of employers of regarding matriculation rather than School Leaving Certificate as the proper test of a high school education, and social pressure of a related kind which influences many parents to force their children into matriculation courses. The very paucity of courses and subject-choices, and the appeal of the "line of least resistance" in the absence of any guidance, explains the rest.

Paradoxically enough, the common belief that one course is easier than another was proved fallacious. Students were followed from grade to grade; those who dropped out compared with those who continued, and

the latter with those following other courses. The differences between students in the different courses had largely disappeared by the end of the ninth year. The same intelligence, the same elementary school foundation in reading, arithmetic, spelling, literature, and language usage, and the same range of Grade VII marks was necessary for completion of two years work in two years regardless of the course. A few differences persisted over this two year period but either these had disappeared by the end of Grade XI or else no pupils graduated from that particular course.

The course of study in Montreal is similar to that in other urban municipalities in Quebec. There may be certain differences in the economic status of pupils. Some schools may tend to be more representative of the "white-collar" occupations than those included in this investigation. Others may have more representatives of the wage earner classes. But the study of Grade VII pupils indicated that the academic potentialities of boys and girls in Grade VII bore little or no relationship to the occupations of their fathers. Certainly the social milieu of the family affects the chances of graduation from high school, as was shown from the study of occupations of the fathers of high school graduates. Financial factors must play some part here: four years at high school not only is an expense in itself, but the son cannot earn anything for his family while he is there. But there is little relationship between the occupation of a man and the general school record of his son.¹ The general conclusions of this study are probably applicable to other municipalities in Quebec even though the general occupational level of parents is higher or lower than in Montreal City.

The Basic Problem.

The main problem is a basic one. There exists only one secondary school course and this is geared so closely to the older faculties of the University that it now benefits no more than thirty per cent of students and perhaps only twenty per cent. That course has several divisions: matriculation, general and commercial. But all cater to the academically élite. These students should certainly be given consideration: but so should others according to their different needs.

An example will clarify this statement. A university gives specialized training in civil, chemical, electrical and mining engineering. These are four divisions of one course, which have as their primary aim the training of engineers. Let us suppose that one division is no less difficult than another, and that the graduate in one branch could graduate with equal ease if he had chosen another branch of engineering; then these choices are valuable, but none the less all produce engineers. But universities also provide courses designed for students of completely differing abilities. Many good engineers would be hopeless failures in the Faculty of Law. Many promising young lawyers could not possibly succeed in the Faculty of Dentistry. These are truly distinctive courses. Such recognition of individual differences, not specialized to quite the same degree, is as essential in the high school as in the university. Our secondary schools have divisions within what is virtually one course, but have no facilities to satisfy the needs of pupils differing in abilities, achievements and interests.

Lowered Standards or Wider Choices?

There are two possible answers to the problem of secondary education in Quebec. One or the other will have to be accepted if large proportions of parents continue to insist that their children be given

¹ The fact that Jewish students tend to surpass Christian ones in school work is a special example of this statement. The former have higher Grade VII marks than other boys and girls attending the same schools; more of them graduate. Yet their parents are not in higher social and economic positions than Christian parents.

a secondary school education or if compulsory education is introduced. The first is that the courses should broaden so that abilities other than those required for matriculation graduation can be developed. This broadening would of necessity require the introduction of new and radically different courses of study. There is one alternative: standards could be lowered with pupils promoted from grade to grade who have not assimilated the current teaching. As a matter of fact this latter process is now operating in Quebec. Employers demand a High School Leaving Certificate of would-be employees; parents realize this and insist that their children secure this diploma. The pressure exerted by parents reacts upon principal and teachers: they make promotions. There is no alternative but to "mark easily" as many pupils lack the foundation upon which secondary education must be built.

Several bits of evidence support the statement that pupils are now promoted who do not deserve promotion on the basis of their actual achievement. No boy or girl repeats any one grade of the elementary school more than once. Only 68 per cent of those entering Grade VII commence Grade VIII. The work is sufficiently unpleasant for the balance to drop out. These include most of the academically poor students. This is confirmed by the figures indicating Montreal Grade VIII students are academically superior to those in corresponding American classes. Tacit recognition of lowered standards was shown when recently the promotion mark from Grade VII to Grade VIII was raised from 67 to 72 per cent. Individual Grade VIII teachers report Grade VII marks have in consequence been raised generally. This is to be expected: otherwise only some 50 per cent of Grade VII students would secure promotion. Such a situation would not be tolerated. But a mere raising of the pass mark does not improve matters. A "bare pass student" is a "bare pass student" whether the promotion mark is 50, 65, 72 or 80 per cent. The fallacy in uncritical interpretation of promotion marks was conspicuously illustrated recently when the principal of a private commercial school proved his students were superior to McGill University Commerce graduates by stating his pass mark was 90 per cent while the McGill one was only 50 per cent. Practically no McGill University students received marks above 90, therefore all his graduates were superior to any McGill University graduates. The fallacy is obvious. Similar false reasoning may convince a few school authorities that standards of secondary school have been raised by changing the promotion mark.

A newspaper editorial recently commented on the fact that our high school graduates do not learn the body of basic facts, which is necessary for modern life. It suggested that teaching is more concerned with rules, theories and principles than with the basic knowledge underlying these. Such a statement requires a good deal of amplification to become a guide for educational reconstruction. But some such weakness in pupils' educational equipment is unavoidable if the general standards of a curriculum are lowered.

More specific recognition of the dangerous situation implied by this lowering of standards is given in a statement made recently by John.L. Tildsley, Assistant Superintendent of schools in New York City. He writes: "they (high schools throughout the country) find themselves faced with the problem of what to do with some 20 or 30 or possibly 40 per cent of their entering pupils who come to them with lying credentials stating that they have satisfactorily completed the work of the lower school, when they have not and in some cases never can. These pupils are incapable of doing, or at least they are not prepared to do any work that has hitherto been conceived as secondary school work. The principal therefore finds it necessary to emasculate the subjects, reduce the content, simplify the methods of teaching them, lessen their educational value, and he then discovers that these pupils cannot grasp even the mere shadow of the once honoured subject; so he introduces new subjects and, unwilling to incur the charge of discrimination against these boys and girls of low learning capacity, he brings in a system of free electives for everybody. By this device and by the

emasculated of subjects which are open to everybody, he makes it possible for his potentially able pupils to work to but a small measure of their capacity and in many cases he effectively dwarfs their growth. Few if any of them in our high schools of this section are building effective habits of work."¹The language is strong, but it is not an overstatement of a perilous situation.

A broadening of curriculum is the preferable alternative. It implies, however, radical educational changes, a re-education of teachers, parents and school authorities, and a modernization of curriculum. The dual educational system in Quebec is complex, the Provincial Secretary, not the Protestant educationists, is responsible for technical education. But these two agencies of the government should be able to reach a satisfactory compromise on the subject of technical training if the Protestant school officials will bring forward a practical solution to the problem of multiple technical courses. There are sufficient competent teachers and intelligent parents in the province to devise adequate courses of study. It is not the purpose of this book to suggest curriculum changes in detail. But certain types of curricula can be suggested which are representative of truly different courses.

A New Vocational Approach.

The commercial course could well become a real commercial course. Subjects additional to bookkeeping, stenography and typing should be presented in a manner which will provide a basis for avocational adult interests. Art, music, and literature appreciation, history and the social sciences, manual training and home economics, open a wide field of choice for these non-commercial subjects. Any of them would be more beneficial than algebra or geometry to the young office worker.

The City of New York is now in the process of introducing a four year course of training for occupations in the food trades. Potential butchers, bakers, cafeteria workers, store clerks, tea room hostesses, and others, will commence a practical and academic four year course adapted to their needs. Half the day will be devoted to training in actual shops operating in the school; the remainder of the day will be spent studying mathematics, social sciences, chemistry, English, drawing and other academic subjects - each related to the work the student is taking in the shop. This is not technical training in the commonly accepted sense. It is vocational training in which "practical" and "academic" are blended. Its need and value have been recognized by industry, which has contributed \$30,000 to the establishment of the course.

Similarly other occupational fields could form the basis for new courses of study. Agriculture, commercial art and interior decorating, wholesale and retail trade, household science, physical training and beauty culture may be mentioned as possible focal points. The courses should not be limited to techniques and skills as is the case with private trade schools. Cultural subjects should form a major part of the work. But these must be presented in a manner that would contribute something to the vocational and leisure interests of the students. Taught as they are at present, these subjects do not educate the boys and girls most likely to need them. Taught as purely academic studies their most probable effect would be the complete rejection of

Such courses together with the existing academic and technical courses will provide adequately for the education of the vast majority of "fourteen-to-eighteen" year old youths. Unfortunately many will reject courses for which they are suited, and will demand an academic secondary education. These students should not be denied as they are

¹ All the Children. Thirty-Eighth Annual Report of the Superintendent of Schools, City of New York, School year 1935-36, p. 80.

at present. If only 20 or 30 per cent of boys and girls can graduate from the four year high school course, a considerably larger percentage could graduate if the same course, or one as exacting of academic ability, were extended to five years. What is needed is an "accelerated" four year secondary school course for those students capable of completing school in this period, and a five year course covering the same academic study for students not capable of completing it in four years. At present all are tied to a four year programme, but the majority are unable to complete it. Failure and repetition of grades produces a breakdown of morale or at least a deadening of interest. The proposed five year course would be open to all elementary school graduates who, on the basis of psychological and educational examinations given at entry, were deemed incapable of completing the four year course without failure. In all probability, most of these boys and girls would benefit more from a different type of curriculum. They might therefore be recommended to a course similar to those mentioned above, and it would then be their option to follow the recommendation or enter the five year course of study.

The New York school system referred to above offers an appropriate model in reconstructing courses. Why? Because New York is a metropolitan area with educational problems much the same as those in Montreal and, to a lesser extent, English-speaking Quebec. Its educationists have recognized and faced the inadequacy of the traditional type of technical courses. "There are all kinds of jobs, requiring all kinds of skill, in all kinds of people. Because of certain social changes, all these kinds of people are coming to school. There is no other place to go except the street. The so-called academic schools must take those for whom an academic education is most fruitful during the adolescent years, and the vocational schools must take those for whom the vocational motivation is most potent. A properly co-ordinated vocational guidance programme will be the scientific selecting agency".¹ This statement is not made from a cloistered university, or by a business man or professional psychologist offering free advice, but by responsible educational authorities who have been faced with the results of faulty education for many years.

That the question of broadened school courses is one of wide and urgent interest can be illustrated by other examples. In Alberta, one of the recent fruits of the active interest which teachers and authorities have brought to school problems has been a reconstruction of secondary courses. On November 10, 1938, Dr. M.E. LaZerte, president of the Alberta Teachers' Association announced a new high school programme designed for students who did not seek university entrance. This offers a multiplicity of subjects and an opportunity for vocational guidance. Dr. LaZerte's comments on these changes included the significant statement: "No longer will high school education in Alberta be limited to a favoured few".

Equally recently, certain schools in France have organized a new orientation course, the purpose of which is to steer children not fitted for university work into other fields of endeavour. The Canadian Press quotes Mr. Charles Le Verrier, the educationist in charge of the project in Paris, as stating: "The country is overflowing with professionals. Many children of mediocre ability are pushed along these pathways to become third, fourth or even tenth rate doctors, lawyers, or teachers merely because their parents see no other future for them. Whereas if an attempt is made to find out the real talent of the child he might be brilliant in another line".

Clearly the problem of inadequate courses beyond the primary level is not local to Quebec. New York, Alberta, England and France are dealing with closely similar problems. Quebec has much to learn from all of them, but even more urgently needs to work out reforms.

Great Britain in the last twenty years has steadily developed a

¹ *Ibid.*, p. 85.

differentiated system which is better organized than most countries. Even if many improvements are still needed, there is a well-laid foundation of elementary, central, technical, secondary and continuation schools, adult education classes, juvenile unemployment committees and centres, and a selective mechanism of scholarships with maintenance grants which begins to operate at the age of eleven.¹

School Teachers Views.

The co-operation of all citizens interested in education will be necessary if an advance is to be made. This description should take in representatives of various sections of the community. But it is reasonable to expect a lead to be given by teachers who experience some of the repercussions of present difficulties as part of their daily life.

When a public Committee was appointed recently² to survey the Protestant educational system in Quebec, the Provincial Association of Protestant Teachers together with the High School Principals' Association presented one of the most comprehensive briefs. These groups of educationists are not only familiar with the existing educational system but form the professional body most interested personally in improving the standards of Quebec Protestant education. Presumably they are more familiar with educational theory and practice elsewhere than is any other representative group. Do they consider reform necessary? And what kind of reform? How do their views as practicing teachers compare with the experimental findings of this investigation?

Their brief supports the view presented in the preceding pages concerning the rôle of the school in relation to the pupil. "It ought to be the inalienable right of every child to be able to attend a well organized school in which the course of study is adapted to meet his needs. Only when this is true can there be equality of opportunity; only when this is true does school education become a training for life". (p. 32). "The course of study should be so developed and arranged that it may be adapted to suit the local needs of the various schools, whether rural or urban.....This flexibility should provide for adaptation to the pupils within a given grade". (p. 34). A careful reading of Chapter IV of the brief(Course of Study:Pre-High School) indicates that all the recommendations made have as one prime object the adaptation of the elementary school to the needs of the developing boy and girl.

The teachers recognize the inflexibility of the present high school system and support the contention that Quebec has in reality only one high school course. They also state that the elective subjects do not provide alternatives satisfactory to pupils lacking in the particular abilities required of matriculation students. "The difference between the courses (General and Academic) is really a technical one..... Why is there very little flexibility with the General Course? . . . The optional subjects provided in the General Course are in fact, or at least in practice, mostly of the same scope as those offered for the Academic Course. The General Course, then, offers chiefly a mere change or reduction of academic subjects without a change of emphasis in the approach to these subjects". (p. 41). This is the point which sections of this book portraying the fortunes of pupils through the grades have amply confirmed.

¹For one of the best critical as well as descriptive summaries of the British situation see the publications of P.E.P. (Political and Economic Planning), Queen Anne's Gate, London. (1) *The Entrance to Industry* and (2) *The British Social Services*. Cf. also Gray and Moshinsky, *Study in Political Arithmetic* already cited.

²In 1937 the Committee asked for briefs from all interested individuals and organizations. The final report of the Survey Committee had not been issued at the time. Page references to the brief presented by the Provincial Association of Protestant Teachers of Quebec refer to the printed form of this brief.

There is close agreement between the criticisms of the present system offered by the Protestant Teachers as a body on the basis of their practical experience and those made in this study on the basis of empirical enquiry. The teachers recommend as a first step in the reorganization of the educational system the introduction of what is called a "6 - 3 - 3" plan. This would involve six years of elementary school, three years of junior high school and three years of senior high school. The advantages and disadvantages of such a plan are of interest here only so far as they affect the progress of the individual pupil, particularly those lacking in the qualifications to embark upon an academic high school training. Apparently this interest in the welfare of the individual pupil is taken care of, for it is recommended that "the course of study in the Junior High School, while providing for the fundamental needs of the children, should be broad in its scope and exploratory in its nature. It should provide instruction in arts and crafts and lay the foundation for further vocational and technical training as well as for academic courses". The recommendation continues: "That the course of study be wide enough to take advantage of the immediate environment of the school whether that be agricultural, technical or commercial, and that it have in view also training in the wise use of leisure" (p. 42). At this point it is also pertinent to note the following quotations from recommendations made in reference to the senior high school: "The choice of courses to be followed in the Senior High School should be determined after a study of the needs of the pupils in the community". "In the larger centres there should be established various types of vocational and technical schools, as well as academic". (pp. 43, 44). These are clear and concise statements of the needs for modernization of the high school; the principles of the change are again emphasized in the wider view of secondary education. The senior high school should be the unit "which carries the pupils through academic, higher vocational and technical courses..... The Senior High School should serve the needs of all who can attend, and should not be drawn from its general purpose by an overemphasis upon the needs of a small number of pupils who are preparing to enter the university. The general course should not involve merely a different alignment of subjects but also a change of emphasis".

Such a programme would be excellent. It would make possible more flexibility, the opportunity for vocational and educational experience and guidance which would be of value to all students. But what does such a comprehensive school system imply? It means the introduction of radically different courses, most of which would be unobtrusively vocational but would have as an underlying purpose the development of appreciative attitudes with avocational values for later life.

The Association apparently does not take the view that an adequate school system training pupils for life must be heavily weighted toward vocational training. Apparently not for the statement is made: "It is the opinion of this Association that the problem of vocational guidance cannot be completely solved merely by differentiated types of schools - cultural and vocational. It must involve differentiation within each classroom. This indicates that we must make considerable change in our present grade system". (p. 48). The force of this argument hinges unduly on the meaning of the words "completely" and "merely". The mere introduction of these two types of class, of course, will not solve the problem of vocational guidance. Attention must be given the needs of the individual pupil; but so little emphasis is given to vocational training in the brief that this quotation raises a suspicion that the teachers would prefer at least an equal emphasis upon the two types of course. Yet if sufficient vocational courses are introduced to provide for the needs of boys and girls who will profit nothing from the strictly cultural curriculum, equal emphasis cannot be given to the two. The problem which is not met here is that of the pupils who are unable to pass the school examinations. Such students should not be barred from vocational training which might prepare them for many of the simpler yet necessary occupations. The brief states that "Except for the final years of the high school, the examination and promotion of pupils are matters that come within the scope of the

principal and teachers of the individual school. If full advantage is not being taken of this control, the remedy lies within the school unit". (p.44). But much fuller advantage - to the point of differently orientated control - will have to be taken of this privilege of promoting pupils if the vocational schools are to receive the pupils who cannot benefit from the cultural courses. The experience of New York in this matter has already been quoted. There are still many matters of organization and method on which further discussion will no doubt be necessary. But that the scope and opportunities of the school system as a whole must be drastically broadened has now become very clear.

Chapter 19

Assisting the Student.

An aspect of educational guidance which has come to the fore again and again in this study is the need for individual diagnosis for pupils in difficulties. A great many boys and girls dislike their studies, fail and repeat grades, not from lack of academic ability, but because of inadequate preparation. They have never learned to read rapidly and accurately, or they have never grasped the fundamental principles of arithmetic. Others lack initiative. Some fail because they are poorly handled at home or at school; either discipline is too strict or too lax. At present, these pupils fail and are ejected from the system. But many are potentially suited to the present course of study. However, they need direction. This means a consultation with pupil and parents or both, which is almost certainly best given by someone other than the teachers.

There is room in the present school system for guidance in this broad sense. In fact the more rigid the system, the more essential that every student secure help who can be helped. But as yet this is an untouched field in the educational system of Quebec. For the greater part, it is "school centred" rather than "pupil centred". Because of this there should be some facilities whereby a maximum number of pupils can be "fitted into" the school routine whether this itself is changed or not. There is an urgent need for a bureau which would investigate, at the request of parent or teacher, the causes of failure in pupils who are intellectually fit for the system. The school reports of a boy who was recently thus examined contained the following notes:

- In October, "John needs to spend more time on arithmetic and French".
- In March, "There is no excuse for such poor work in literature, French and hygiene".
- In April, "I'm glad to see the improvement. Try for 70 per cent next month".

But there was an excuse for the poor work in arithmetic, literature, and French. John's mental development was deficient in certain specific respects. If corrective procedures based on a careful diagnosis of his difficulties had paralleled his seventh grade work, improvement could have been achieved much more rapidly. These weaknesses had caused John's failure in two preceding grades; but except for these special defects, he was a boy of at least average mental ability. Even in a "school centred" educational system he would have succeeded, with the type of guidance outlined above.

Guidance to Whom, and When?

Such guidance should commence by the third or fourth grade in elementary school. Admittedly this is a large undertaking. It is not a simple function which can be added to the teacher's work, though some experimentation may be feasible especially if the number of teachers is increased. But a consultant or advisory service is probably the best beginning. Educational diagnosis is a specialized operation needing to be carried out under the direction of a competently trained psychologist. At present guidance of this type is completely lacking in Montreal and no study of its effects can be made. But even the most conservative prediction of its value, places some organized service for student counsel on the list of necessities for a school system as rigid as that with which we are dealing.

A necessary part of the approach towards educational reform is undoubtedly to enquire whether changes should be made in the present

system of seven years elementary school and four years of secondary school. A transition should be possible at an earlier age than fourteen.¹ A junior high school (such as the one recently instituted in Westmount or of the type recommended in the Protestant Teachers' brief) is a step in this direction. It offers many advantages, including the formation of sound experience on courses later to be encountered. Such specialized courses as have been suggested could well inform continuation-studies to be taken after junior high school. There is a serious danger that must be guarded against, however. The academic standards of the junior high school should not become high enough to bar from the specialized courses the very boys and girls who could most benefit. Again the New York report previously quoted is illuminating: "The vocational school of twenty-five years ago was organized to train a limited number of boys and girls for specific skills which would fit them for definite crafts which were apparently fixed and immutable. At first they were considered the dumping ground of the academic school. Then they took on some of the glamour of the select finishing school and began to do a little rejecting on their own account. They too adopted standards - eighth grade graduation, examinations in arithmetic and English, intelligence quotients, all with the astounding result that those who had graduated from elementary school and were rejected by the vocational school, had no other refuge than the academic high school, and promptly went there to fail again. That kind of educational buck-passing is outmoded".² If reforms are made in Montreal, it is imperative that enlightened public opinion be aware of this possibility. The tradition of education as preparation for university instead of preparation for life dies hard.

Vocational Advice and Placement.

The large number of pupils who drop out of school need vocational guidance. They commence their search for work blindly or within narrow limits. The positions secured by many of the boys who were covered by this investigation were wholly unsuitable, or unsatisfying to them. It has been proved, however, from carefully controlled investigations conducted by the National Institute of Industrial Psychology in London, and the Education Authority of Birmingham that boys and girls over 14 years of age can be directed in the choice of work with a high degree of success.³ The techniques of these same projects were used successfully with the present sample of high school leavers and with others. But a fundamental need stands in the way of immediate extension. It is futile to recommend any widespread vocational guidance unless placement accompanies the guidance. At present only a minority of children could benefit from vocational guidance: those whose parents can give them training outside the public school system. This number may be supplemented by a few boys who possess more than an average degree of initiative. But most young people require placement as well as guidance. Properly organized juvenile placement bureaus are an urgent need and vocational guidance should be a specialist department of the Employment Service system, whether set up particularly for juveniles, or operating for the Service generally.⁴ Meanwhile for desiring guidance and capable of helping their children get work or training can only secure it from an organization outside the school system.

¹ The Hadow Report, one of the most important and influential of all state educational reports in England, has set the objective of making choices of courses and the first selection of pupils by scholarship examinations at the age of eleven.

² op. cit. p. 95.

³ The writer has given vocational guidance to approximately a thousand individuals since this investigation was completed, and it is invariably true that boys who leave school with a limited education find "blind-alley" jobs. Guidance alone is not sufficient in most instances: placement must supplement the guidance.

⁴ Cf. N.W. Morton. *Individual Diagnosis: A Manual for the Employment Exchange*(McGill Social Research Series, No.6).

Forecasting School Progress.

Several matters of more detailed bearing have been raised by the study in addition to the major conclusions so far set out.

An obviously important one is, how far can the showing which the young pupil will make be anticipated? The probable school progress of students can best be determined by comparing their results on various tests with critical scores empirically determined. But no measure is infallible, and an exact mark means little by itself. Certain significant minimum marks can be established, however, from intelligence tests, standardized achievement tests, and school work. Pupils obtaining marks below these levels stand practically no chance of progressing beyond predictable grades in the present educational system.

Superficially, school marks are the best single index of future academic work: actually, they are of questionable utility as the achievement represented by a certain mark may vary from year to year.¹ In the present study, it was found that students with a Grade VII average below 75 had no chance of graduating from high school without repeating a grade; those with marks below 80 had very little chance. Pupils were formerly promoted if they attained marks above 65 per cent. This pass mark has since been raised to 72. The pupil who, a few years ago, received 65 now receives 72; but he is a "bare pass pupil" regardless of what the pass mark may be. This change alone necessitates the rejection of 75 and 80 as critical marks. Now the critical marks will be higher, though it is impossible to estimate how much they have been raised. Fluctuation in the mark which actually differentiates successful from unsuccessful students may occur from year to year even though no change is made in the pass mark. Furthermore, where papers are set in one school and marked by the teachers of that school, marks may be highly consistent from year to year within the school, yet little agreement may exist between these and the marks of another school. These uncontrollable factors render doubtful the value of school marks for guidance, when they are not supplemented by other data. Standardized psychological tests designed to measure abilities and achievements in specific fields offer a valuable supplement. The critical scores derived from these measures are not so subject to fluctuation, and they will be applicable within a school from one year to another. It may be that different critical scores for one test will be necessary if comparisons are made from one school to another; but these too will be constant from year to year.

A number of different measures are necessary, as one standardized test is not sufficient. Apparently any group of four to six good psychological examinations will suffice, provided they measure attainment in a number of different skills. Intelligence tests, in particular, are not sufficient. They serve a valuable purpose but, as in the case of other examinations, they should be supplemented.

Should the educational system be broadened, an ideal arrangement of tests would include measurements prognostic of achievement in each of the optional courses. An empirical study of these would indicate the best weighting of one examination against another, and their use

¹ An illuminating picture of the difficulties involved in marking examination papers is shown clearly in the English report, *An Examination of Examinations*, by Sir Philip Hartog and E. C. Rhodes. (Macmillan, 1935). From a number of possible quotations the following is chosen:

"It was found that when fourteen experienced examiners re-marked independently fifteen scripts which had all received the same moderate mark from the examining authority by which they were furnished, these examiners, between them, allotted over forty different marks to the several scripts. It was found, further, that when these examiners re-marked once more the same scripts after intervals of from twelve to nineteen months, they changed their minds as to the verdict of pass, Fail and Credit in 92 cases out of total of 210." (p.10).

for different purposes. For example, a mechanical assembly test had little prognostic value in reference to success in the present Quebec matriculation courses, but the same test might be of decided use in a trade or technical course.

Overriding influences must always be looked for. Examples have already been pointed out where critical scores did not indicate the later achievement of a boy, and in such cases environmental factors and personality qualities usually account for the deficiency of the prognosis. These instances indicate the weakness of purely mechanistic administration and interpretation, whether of psychological or school tests. To sum up the matter, prediction of school success cannot be routinized. A pupil's results must be interpreted in terms of his whole personality. Finally there is need for some periodic review which would bring to the attention of the administrative officers those students who could most benefit by a diagnosis of their particular difficulties; though of course this will be only a half-measure unless it is followed by remedial work.

School Marks.

The validity of a particular school mark has been questioned. And in any case, most parents do not have sufficient information at their disposal to evaluate the actual marks that children receive in secondary school. But parents can recognize the general importance of a comparatively high or low mark. They should pay attention to the position their child obtains in comparison with other students in the class. For this reason a pupil's rank in individual subjects should be placed on the report card. Even then the prevalence in some schools of "inferior" and "superior" classes will make evaluation of these ranks difficult. This clue, therefore, is valuable only if the boy or girl attends a school where each class is "average".¹ Again, marks (or rank orders) have greater value in some subjects than in others. This too varies with the school. In general, however, the boy who is comparatively poor in one subject will continue to be poor in that subject. If improvement is to be obtained, he must receive remedial training outside the school room. Psychological tests designed to diagnose particular educational difficulties are likely to give the most informative help on which special tutoring may be based. Such tests, however, should be given by examiners thoroughly experienced in the problems, and interpreted on a wide personality base. Tutoring, too often, is directed solely to bringing the pupil's achievement in a particular "subject" to the point where he can pass a set examination. It overlooks weaknesses in the fundamental grasp of the material; and if it does this the gap in the boy's equipment will remain even though he may "cram" successfully for a pass.

Boys' and Girls' Needs.

This investigation was concerned largely with boys. Girls were examined in a few instances. There were a sufficient number of these cases to direct attention to one conclusion: girls make better progress in the Quebec high schools than boys. Further investigation is warranted on this point, particularly as more girls go to business colleges, or are less likely to come to high school than their brothers. None the less, the results indicated that boys had more difficulty in completing elementary school than girls. No group of girls was followed through high school for any length of time. But there were indications that they made better progress.² The implications of this

¹ These statements are not to be interpreted as a criticism of "graded" classes. When there are a sufficient number of pupils to warrant grading in terms of academic ability, such "graded" classes should be beneficial to all students.

² This condition is not restricted to Quebec. When gainfully employed men and women (in the Prairie Provinces) are matched age for age, it is found that women have more formal schooling than men. Many factors may be involved in the statistics; e.g., women who pursue paid employ-

are serious. The educational system should help boys and girls prepare for life; and this includes preparation for a vocation. If boys have greater difficulty than girls, they will tend to drop out of school more quickly. Yet a high school education presumably has greater vocational value for the boy than for the girl. Lack of a High School Leaving Certificate will close many fields of work to the boy. It is less likely to be a barrier for many "women's occupations", and girls also have the prospect of marriage. A vocational career for girls may be regarded as temporary. This is not to suggest that girls should not have secondary education, or that they do not need it. But there is room for considering more closely the differences between boys' and girls' progress. If more boys need graduation, yet fewer attain it, their curricula, including matriculation courses, should be adjusted. Again, this points toward a broadening of educational resources.

Employment Potentialities of High School Graduates.

Many employers insist upon high school completion as a qualification for prospective employees. The wisdom of this as a general practice is highly questionable. Certainly, high school graduates are superior academic material, and usually they are better than the non-graduates. But this very superiority - the high school regime being what it is at present - makes the high school graduate a questionable employee in many occupations. He has been trained to think with words and ideas. He will want to use this skill when carrying out routine tasks. He will justly consider himself too good for permanent irresponsible or uncreative work. He seeks promotion to occupations with more scope. If he is hired for a position in which his work and his promotion is limited, he will be a dissatisfied worker. A few such workers can cause a great deal of indirect difficulty in an organization and a large number can react unfavourably upon the company's relations with the public. Moreover, frustrated individuals in this situation may develop highly unsatisfactory personality maladjustments. Called upon to carry out work which is beneath their capacity, they will complete these tasks but in an inefficient manner. Other aspirants to the job with less academic ability may be somewhat slow in learning their duties; but they have to exert all their intelligence and potential skill in completing their work. Such persons, lacking in academic training, may thus prove highly satisfactory in many occupations which are indifferently filled by young men with matriculation standing.

Everything depends, of course, on the possibilities - or lack of possibilities - for advancement. The calibre of the average high school graduate - certainly, in the long run - demands something better than a position with no training and responsibilities at all. Of course he is not equipped to handle responsibilities immediately upon leaving school. He may make an excellent office boy for a time. But he should not be hired for a job in which he will permanently be an office boy. Even from a purely selfish motives, business houses should not try to fill the lower ranks of clerical and commercial occupations with graduates from the present Quebec educational system. If they have to stay there, these boys will be neither efficient nor satisfied when they become adults.

The Basic Setting of Vocational Guidance.

Obviously vocational guidance should be part of a differentiated educational system. But the agency responsible for guidance must also go beyond the confines of the school and work closely with placement agencies. These latter, to be most effective, should be organized

ment may have more schooling than those not so occupied. A heavy weighting is probably due also to the inclusion of business college courses in the figures. Even so, the existing situation is distressing if formal schooling is meant to be of vocational value. See "Occupations in Relation to Length of School Life for the Provinces of Manitoba, Saskatchewan and Alberta". Dominion Bureau of Statistics, 1936 Census Bulletin, No. XXXIII, 1938.

under government control, and should be aided by advisory committees with educational and industrial representatives. So long as employment opportunities are unorganized, uncanvassed, or uncertainly known, vocational or educational advice can have only the most limited application. Without a broadened educational system or adequate employment bureaus, the vocational guidance expert works in a vacuum.

There are a few exceptions. A vocational guidance service can be of immediate value to one group within the present school system, namely, pupils who are in their final year of high school. Direction is easier and most likely to have results even if no other reforms are made, because of the general superiority of this group. It has also been made clear that some facilities for individual counsel at the seventh grade would be valuable because of the importance of class-ratings at this point. But throughout, the extent to which careful educational guidance can be justified will depend upon the rigidity of the school system.

Teachers' Viewpoints.

Several suggestions in reference to vocational guidance were made to the Protestant Education Survey Committee. Those made by the Provincial Association of Protestant Teachers deserve special attention as teachers must act as an essential link in any guidance project.

The P.A.P.T. brief makes two recommendations regarding vocational guidance, as follows:

- (1) That, in the meantime, some progress in vocational guidance be secured through the presentation of films showing (a) industrial processes, and (b) different vocations.
- (2) That the first year of Junior High School be an orientation course at the conclusion of which some direction could be given pupils as to suitable courses to follow.¹

The recommendation that some direction could be given pupils as to suitable courses to follow is presumably correlated with a broadened educational system which the teachers recommend. Should the educational system not be modified a certain amount of guidance can still be given pupils in reference to already existing courses. But the inadequacy of such guidance must of course be recognized. The brief also implies that this educational guidance be given by teachers. This would be satisfactory in the present school system; but it would be inadequate if truly optional courses of study are introduced. They would certainly have a value in giving vocational information.²

The suggestion of motion pictures is interesting and helpful. Vocational information, however, should not be confused with vocational guidance. There is an evident need for a much wider knowledge of available vocations and of courses of study. Much of this, also, could be provided by the methods recommended in the last years of elementary school (or the first year of a junior high school if this is instituted).

There can be no quarrel with these recommendations. However, certain questions fundamental to guidance are not dealt with: systematic direction to occupations, training outside the school system, and placement. Nor is reference made to the rôle of guidance in the

¹ Op. cit., p. 49.

² The Alberta Teachers' Association have recently published a valuable contribution to vocational information in the form of a volume, *Choosing Your Life Work*, which is a practical manual devoted to occupations, their requirements, possibilities of promotion, etc.

Under the McGill social research programme, two projects are nearing completion which are more intensive studies of present training and vocational facilities in Montreal, for young men and young women respectively.

development of maximum achievement in pupils within the school system.

The point of view which led to the recommendations explains these omissions. An examination of the preamble, "What a Guidance Programme would Involve", indicates only a limited conception of guidance, as a point of view or philosophy on the part of teachers and administrators. Guidance can be best furthered through a change in existing attitudes, whereby the individual pupil will be regarded as a developing organism with certain potentialities in the form of aptitudes, habits and attitudes. The duty of the teacher should be to understand the basic principles of growth and development in the pupils under her charge and to guide them toward a condition of social, emotional, and physical maturity. The Association suggests the need of some functional service within the school system to make psychometric tests, secure developmental histories and other data upon which the teacher will guide the child. It is recognized that such guidance will necessitate a new point of view on the part of teachers, and that teachers-in-training should be given the knowledge necessary to provide such guidance.

This statement is presumably not to be interpreted as a specific recommendation but rather as expressing the ideal toward which education should be guided. It over-simplifies the problems of guidance, however, if it implies that guidance in all aspects of the child's life can be achieved through an ideal school system. This is very questionable. The pupil may spend 25 hours a week in school, but innumerable factors influence his life during his waking hours away from school. Many of these are more important to the development of social and emotional maturity than experiences within the school room. The suggested new point of view on the part of teachers would certainly be beneficial, but it cannot provide all-round guidance. The practical approach must recognize that a number of specific details have to be dealt with, both within and outside the school environment. These include the building of sound study-habits, diagnosis of educational difficulties and prescription of remedial work, direction towards certain courses of study rather than others, guidance toward certain occupations or training facilities outside the school system, the development of special services to deal with unusual behaviour problems.

Unquestionably, the teacher with a sound training in psychology to supplement the kind of personality which "draws children out", can instil sound study habits in the young pupil. But the teacher responsible for the general progress of a full class room of children has not the time, even if she has the training and inclination, to concern herself with the educational difficulties of individual pupils. Given sufficient knowledge concerning the child's history in school, home environment, interests, and developmental trends, the teacher may guide the majority of them toward certain courses in the school system, provided the options are not too extensive. Apart from other considerations teachers do not have sufficient time to develop the knowledge of occupations necessary to make vocational recommendations. Clearly it is impractical for individual schools to organize placement services.¹ Furthermore teachers are handicapped by the fact that they have most pupils under their care for one year only.

A caution needs to be registered against the over-simplification involved in what may be called the "life-guidance" view of teaching. But the brief as a whole echoes the necessity of specialized guidance projects. The general recommendations made are satisfactory so far as they go. But the new organization needed to give vocational direction, and educational aid to pupils with learning difficulties, is a large and severely practical task. Whatever modifications are made in the present educational structure, however, will depend very largely for

¹ Most school principals are asked to give advice and do their best to help pupils get suitable jobs. But it is neither fair nor economic to place this function on the schools. Placement work demands organization special to itself.

their results on the support of the Quebec teachers and principals. That they have requested a modified school curriculum and a school system better adjusted to the needs of individual pupils, is a strong platform on which to build for the future.

Final Recommendations.

The chief concern of this study, and the conclusions to which it has been drawn, centre essentially in the need for a sound guidance programme for schools in Quebec. Because of the limits of this survey, what is said here applies principally to the larger cities. Rural schools sorely need guidance services, but they also need special study.¹ To a lesser extent, however, the developments advocated apply to the schools in smaller centres.

Whether these recommendations are "practical" is likely to be judged in some part by reference to the financial structure of Protestant education. Many other improvements in the school system are handicapped for the same reason, and it is to be hoped that one of the results of the new enquiry will be to widen substantially its economic resources. A properly equipped guidance organization will of course necessitate new expenditures. But at present large sums are being spent on secondary education which have the effect of turning out misfits into the occupational world. A secondary school course which provides a satisfactory education to only 20 per cent of the pupils commencing it, is a luxury we cannot afford. If we are to move away from this, changes based on the following principles are recommended, as the verdict of the present study and of the experience of other related vocational work:

1. A broadened curriculum providing opportunities for the development of different abilities, skills, and interests, and unfettered by "academic" preoccupations is essential if schools are to cater for a wider, or the whole, juvenile population.
2. Educational and vocational guidance must be based upon research. A research bureau or department is needed for the development of sound techniques adapted to the specific conditions of Quebec and Canada.
3. Guidance must be based upon a systematic study of the individual in relation to his environment. An important function of the research bureau recommended above would be the study of techniques for revealing individual progress and maladjustment, which could be employed by teachers and qualified examiners. The general objective of this research would be to prepare the individual pupil to meet the educational and occupational world in an effective manner.
4. Cumulative school records available to the teacher would provide an inexpensive aid to the study of the individual pupil. Innumerable difficulties were encountered in the present investigation owing to the lack of any systematized plan for following individual progress from year to year. Such cumulative records would have to be "cleared" or transferred so as to cover all schools throughout the province, since their value is disproportionately limited if they are restricted to progress within one municipality.

5. Remedial training should be provided for pupils deficient in specific skills or aptitudes. Diagnostic tests applied under competent supervision can uncover a number of specific academic difficulties which face the pupil. Remedial work is a matter for further organization, which cannot be undertaken by regular class room teachers. But one trained worker in a school could save large numbers of misfits annually.

¹ One of the problems of the wider educational picture is that secondary school facilities are largely co-

6. Guidance service, in remedial training, choice of school subjects, and choice of occupation needs to be developed for the school system as a whole with a competent director in charge. Educational psychology should be a necessary part of his training, for various reasons which have been exemplified in this book. Experimental research into the problems of the psychological development of the individual is today proceeding at a rapid rate. It must be emphasized that inexpert or amateur administration and interpretation of psychological tests may produce misleading and even harmful results. The specialists in remedial training preferably should work in contact with an expert. If available to the schools for consultations with teachers he could also aid in a more general way in the resolving of problems of choices of courses, etc.

7. Comprehensive vocational and educational information is urgently needed. This could best be given in "junior high schools" if this type of school is introduced. If not, Grade VII would be the logical place to introduce such information. Talks, moving pictures, and books would be of considerable help. Surveys (which necessitate the cooperation of employers) have been attempted by many private bodies in the past, and these may be co-ordinated, but a comprehensive one conducted under educational auspices is still needed. Orientation classes introducing studies representative of curricula in different secondary school courses would be the most efficient way of giving educational information. On a large scale such courses may not be immediately practical, but experimentation should be tried.

8. A minority of pupils can benefit from vocational guidance without placement. Organizations already exist outside the school system where such guidance can be secured. Probably arrangements could be made with these organizations whereby high school graduating classes could receive vocational guidance.

9. The recommendation of school leavers to particular occupational groups can only be finally justified if adequate employment opportunities are available. Without the central organization of placement services, little can be done to help the pupil who drops out of school before completion of his course.

Most of these recommendations are broad in scope. The details of the pattern into which the services recommended would have to be incorporated cannot be specified until the recommendations of the Protestant Education Survey Committee have been acted upon. But the problems are more urgent, and the results of their solution more widespread, than has generally been realized. They are problems which concern pupils, teachers, parents, and employers. An enlightened public opinion should not be hard to seek from these sources. If it can be generated to support the co-operative efforts of education specialists and the school authorities, a new secondary school organization can be built up within which pupils will be guided and trained to take their places more securely and successfully in the life of the community.



Appendix A. The Groups Examined and the Nature of the Examinations.

Group A-1(257 Grade VIII boys who entered School A in September 1931).

Psychological and educational tests were administered to these boys, after school hours during the months of December 1931, January and February 1932, as follows: (1) Otis Self-Administering Tests of Mental Ability, Intermediate Examination, (2) Minnesota Paper Form Board, (3) Miner's "Analysis of Work Interests" blank, (4) selected sections of the New Stanford Achievement Tests (reading, arithmetic, spelling, language usage and literature). Those boys in the group who entered Grade IX in September 1932 were given (5) the Orleans Geometry Prognostic Test, in September 1932 and (6) the American Council Beta French Test, in the following November.

The group was divided into two sections one of which chose the Latin option, the other general science. The progress of the sections was followed through the four years of high school.

Comparison of this group with A-2 gave no indication that test scores were affected through writing examinations after school hours.

Group A-2(311 boys entering Grade VIII in School A in September 1932).

The following psychological and educational tests were administered to these boys: (1) the Otis Self-Administering Tests of Mental Ability, (2) the Orleans-Solomon Latin Prognostic Tests (to that section of the group which was about to commence the study of Latin) and (3) the American Council Beta French Test. All tests were given in the morning during school hours. The two first-mentioned tests were administered at the commencement of the school year, the latter in November 1932.

The group was divided into three sections. One chose Latin, another Science, both of these leading to matriculation; a few students followed a General course leading to a School Leaving Certificate. The progress of the groups was followed through high school.

Group B-1(89 boys completing Grade VIII in School B in June 1932).

These boys were taking Latin, with a view to matriculation. No psychological tests were administered to this or any other group of students in School B. Consideration was given only to ages and school marks. The records of the students were followed through the high school course.

Group B-2(85 boys and 45 girls completing Grade VIII in School B in June 1933). This group was similar to Group B-1.

Group B-3(36 boys and 108 girls completing Grade VIII in School B in June 1932).

These students differ from those in Group B-1 in one respect, they elected a Commercial course in preference to a matriculation one. The boys in the group were followed through high school. Consideration was given the records of girls only for comparative purposes (to give some guide as to how closely conclusions derived from the study of boys could be extended to girls).

Group B-4(29 boys and 118 girls completing Grade VIII in School B in June 1933).

This group is similar to Group B-3. Records were examined for one year only.

Group C-1 (142 boys in Grade VIII of School C in September 1931).

The same psychological tests as were administered in School A (December 1931 and January-February 1932) were given after school hours to these boys in December 1931. School records were followed for one year.

Comparison of this group with C-2 showed that test scores had been affected through writing their examinations after school hours. These boys had only 30 minutes for a cold lunch. This apparently affected their work after school hours: it was irregular, not lowered generally. Consequently the group was followed up for only the one year.

Group C-2(122 boys and 116 girls in School C in September 1932).

(1) The Otis Self-Administering Tests of Mental Ability and (2) a specially constructed clerical ability test were given to these students in the fall of 1932. (3) Those sections of the New Stanford Achievement Tests which had been administered to Groups A-1 and C-1, were given to two classes in the School. School records of the boys were followed for two years and the school leaving records were examined. School records of the girls were not followed.

Group D(993 boys and girls attending Grade VII classes of 11 elementary schools in March 1933).

(1) The Army Alpha Revised and (2) Revised Beta Examinations of intelligence together with (3) the Haggerty Reading Tests Sigma ³ were given to these pupils during school hours in March 1933. School records were examined only in June 1933.

Group E(73 boys completing Grade XI in June 1934.)

(1) The Otis Self-Administering Tests of Mental Ability, (2) the N.I.I.P. Clerical Test (American Revision), (3) the Minnesota Paper Form Board, and (4) the Minnesota Assembly Test were given these boys during July and August 1934. Each was given (4) an hour's interview and (5) supplementary information concerning each boy was secured from the parents. All boys in this group had written the matriculation or school leaving examinations.

Group F(205 students attending a high school or Technical Institute in a small Quebec industrial centre in 1933-1934).

(1) The Otis Self-Administering Tests of Mental Ability, (2) Revised Beta Examinations, (3) Minnesota Paper Form Board, and (4) the Cox Mechanical Ability Tests were given to the high school students. Pupils (mainly French-speaking) attending the Technical Institute were given the same tests with the exception of the Otis Self-Administering Tests of Mental Ability.

School records were obtained from this group for one year only.

Group G(184 boys unemployed in November 1931).

The same psychological and educational tests as were given to Groups A-1 and C-1 were administered to these boys in January and February 1932. These boys were selected from among 1,500 English-speaking juveniles who had registered in a city-wide survey of juvenile unemployment conducted by the Montreal Boy's Work Council.

Summary of Sample Groups.

Group	Sex	Number	Group	Sex	Number
A-1	M	257	C-1	M	142
A-2	M	311	C-2	M	122
				F	116
B-1	M	89	D	M	482
B-2	M	85	E	F	511
	F	45		M	73
B-3	M	36	F	M	150
	F	108		F	55
B-4	M	29	G	M	184(a)
	F	118			

N.B. All pupils in Groups A-1 to C-2 were in Grade VIII. Those in Group D were in Grade VII, Group E students had completed Grade XI. For Groups F and G, see Table III.



Appendix B. Statistical Tables*

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*Tables referred to in the text as Statistical Supplement tables are those contained in the special mimeographed set, obtainable on request.



Table I. Age Distribution of the Sample Groups.

Group	Sex	11	Percentage Distribution by Age (years). Total = 100							Total	
			12	13	14	15	16	17	18		
A-1	M	--	3.7	33.0	38.5	18.8	4.1	1.8	0.5	-	100
A-2	M	-	1.3	30.2	35.7	22.6	7.4	2.9	-	-	100
B-1	M	-	-	37.0	46.1	15.8	1.1	-	-	-	100
B-2	M	-	1.2	37.6	43.5	15.3	2.4	-	-	-	100
B-3	M	-	-	41.7	41.7	13.8	2.8	-	-	-	100
B-3	F	-	-	38.9	38.9	20.4	1.9	-	-	-	100
B-4	M	-	3.4	41.4	41.4	13.8	-	-	-	-	100
B-4	F	-	-	28.0	52.5	17.8	1.7	-	-	-	100
C-1	M	-	4.0	34.0	33.0	19.0	7.0	2.0	1.0	-	100
C-2	M	-	2.0	23.0	45.0	20.0	7.0	2.0	1.0	-	100
C-2	F	-	5.0	28.0	30.0	28.0	6.0	2.0	1.0	-	100
D	M	2.3	32.2	29.3	20.1	12.2	3.7	0.2	-	-	100
D	F	3.1	35.3	32.9	19.0	6.7	2.4	0.6	-	-	100
E	M	-	-	-	-	-	10.9	41.0	34.2	13.7	100

Table II. Ages (where known) and Grades of the Pupils Comprising Group F

Grade	Age (years). Numbers										Total
	11	12	13	14	15	16	17	18	19	20+	
VI	8	7	6	6	1						28
VII	1	5	10	6	4	-	-	-	-	-	26
VIII	-	-	5	7	6	3	-	-	-	-	20
IX	-	-	-	2	5	6	5	-	-	-	18
X	-	-	-	-	3	3	7	2	-	-	15
XI	-	-	-	-	1	2	6	3	1	-	13
XII	-	-	-	-	-	4	1	1	-	-	6
Preliminary	-	-	-	1	1	7	-	5	-	-	23
1st Year	-	-	-	-	-	2	4	3	6	-	15
2nd Year	-	-	-	-	-	-	2	3	3	3	11
3rd Year	-	-	-	-	-	-	-	1	1	2	4
4th Year	-	-	-	-	-	-	1	4	2	2	9
Total	9	12	21	22	21	23	38	11	14	7	188

Table III. Grade at School attained at time of Investigation by Pupils in Sample Group F and final Grade Completed before Leaving School by Boys in Sample Group G.

Grade	Group F		Group G	Grade	Group F		Group G
	Boys	Girls			Boys	Girls	
IV	-	-	9	XII	11	1	-
V	-	-	19	Prel.	23	-	-
VI	16	13	29	1st.	15	-	-
VII	16	19	47	2nd	11	-	-
VIII	15	9	18	3rd	7	-	-
IX	11	6	19	4th	9	-	-
X	5	5	7				
XI	11	2	12	Total	150	55	184 (a)

(a) Including 24 boys who did not specify grades completed.

APPENDIX

Table IV. Age Distributions of the Groups of
Unemployed Boys.

Age 5	Group 1		Group 2		Group G	
	No.	P.C.	No.	P.C.	No.	P.C.
13-14	98	9.8	56	9.5	10	5.4
15-17	664	65.5	370	62.5	118	64.1
18-20	247	24.7	165	27.9	55	29.9
Total (a)	1,009	100.0	592	100.0	184	100.0

(a) includes one boy whose age was unspecified in Groups 2 and G.

Table V. School Grades Completed by the Groups
of Unemployed Boys.

Grade	Group 1		Group 2		Group G	
	No.	P.C.	No.	P.C.	No.	P.C.
4	102	10	44	7	0	5
5	152	15	99	17	19	10
6	218	22	127	21	29	16
7	273	27	171	29	47	26
Attended High School	251	25	117	20	56	30
Not specified (a)	13	1	34	6	24	13
Total	1,009	100	592	100	184	100

(a) Differences in methods of tabulating account for these differences
in the number of cases in which educational level is not specified.

Group 1: 1009 boys who registered as unemployed in the survey of unemployed juveniles in Montreal carried out in December 1931.

Group 2: 592 boys included in Group 1. The school records of these boys were analysed as part of the work of this study.

Group G: 184 unemployed boys studied by means of psychological tests. These boys are also included in Group 1 and there is a certain amount of overlapping with Group 2.

Table VI. Occupational Status of Fathers of Pupils
in the Sample Groups.

Occupational Class	Group	Number	Percentage (Total of each group = 100)
1. Higher professional and administrative work	A-1	11	8
	C-1	-	-
	D	9	1
	E	27	39
	G	-	-
2. Lower professional, technical and executive work	A-1	14	10
	C-1	11	11
	D	57	7
	E	11	16
	G	-	-
3. Clerical and highly skilled work	A-1	39	28
	C-1	30	29
	D	207	25
	E	18	25
	G	18	16
4. Skilled work	A-1	53	30
	C-1	30	29
	D	282	34
	E	14	20
	G	45	40
5. Semi-skilled repetition work	A-1	25	18
	C-1	14	14
	D	195	24
	E	-	-
	G	32	29
6. Unskilled repetition work	A-1	11	6
	C-1	19	18
	D	76	9
	E	-	-
	G	17	15

Table VII. Languages Spoken at Home by Pupils Tested.

Group	Number			Total	Percentage		
	English Only	Jewish	Other Languages		English Only	Jewish	Other Languages
A-1	135	3	17	155	87	2	11
A-2	276	8	35	319	87	3	10
C-1	76	24	10	110	69	22	9
C-2	183	25	34	242	76	10	14
D	541	264	97	902	60	29	11
E	55	17	1	773	76	23	1
G	120	5	1	126	95	4	1
Total	1,386	346	195	1,927	72	18	10

Table VIII. Distribution of Otis I.Q.'s; Pupils in First Year of Secondary School.

Group and Course		Sex	No.	Mean	S.D.	Q1	Q3	Sk.
Arts	A-1	M	116	107	10.4	100	114	-.58
Arts	A-2	M	170	107	11.4	99	115	-.26
Arts	A-3(a)	M	151	110	10.2	105	118	-.29
Science	A-1	M	108	104	10.1	97	112	-.63
Science	A-2	M	142	102	9.5	95	110	-.31
Science	A-3	M	135	106	9.6	100	113	-.34
General	A-3	M	28	105	8.7	97	109	-.29
Commerce	C-1	M	133	100	10.4	94	106	-.27
Commerce	C-2	M	120	103	10.2	96	111	-.29
Commerce	C-2	F	116	102	11.3	96	110	-.27

(a) A-3 is a group which entered School A in September 1933. Only intelligence test data were secured from these pupils.

Table IX. Intelligence Quotients of Pupils Satisfactorily Completing Grade VIII and IX, Compared with Others.

Group and Course		No.	Mean	S.D.	Sk.	Overlap
Arts	{(a)}	74	108	10.5	-.86	
A-1	{(b)}	40	106	9.3	-.32	28.7
Arts	{(a)}	87	110	9.9	-.60	
A-2	{(b)}	75	103	10.8	-.28	22.5
Science	{(a)}	57	108	9.3	-.32	
A-1	{(b)}	50	100	9.3	-.32	18.0
Science	{(a)}	67	106	8.4	-.71	
A-2	{(b)}	74	99	9.0	-.33	20.7
Commerce	{(a)}	39	108	9.6	-.74	
A-2	{(b)}	82	101	10.2	-	24.4
General	(c)	21	103	8.4	-	
A-2						

(a) Students who completed Grades VIII and IX in two consecutive years without changing schools or courses of study.
 (b) Students who, for any reason, did not complete their two years in the normal period without changing schools or courses of study.
 (c) Pupils in the General Course, transferred to this in the ninth grade.

All pupils are from sample A-2 except first group enumerated above in Arts, and first group in Science (both from A-1).

Table X. Reliability of Differences in the Mean I.Q.'s of the Various Groups.

Difference Between				Critical Ratios	
				(A)	(B)
A-1	Arts	A-2	Arts	0.0	50
A-1	Arts	A-3	Arts	2.4	99
A-2	Arts	A-3	Arts	2.5	99
A-1	Science	A-2	Science	1.6*	94
A-1	Science	A-3	Science	1.6	94
A-2	Science	A-3	Science	3.5	100
A-1	Arts	A-1	Science	2.2*	99
A-2	Arts	A-2	Science	4.2*	100
A-3	Arts	A-3	Science	3.4*	100
A-3	Arts	A-3	General	2.7*	100
A-3	Science	A-3	General	0.5*	69
C-1	Boys	C-2	Boys	2.3	99
C-1	Boys	C-2	Girls	1.4	92
C-2	Boys	C-2	Girls	0.8	79
A-1	Arts	C-1	Boys	5.3*	100
A-1	Science	C-1	Boys	3.0*	100
A-2	Arts	C-2	Boys	3.1*	100
A-2	Science	C-2	Boys	0.8	79

(A) Ratio of the difference between the two means and its standard error.

(B) Number of chances in 100 of a true difference greater than zero being represented.

*Indicates that the difference favours the first group. Where the sign is absent, the mean of the second group is higher than that of the first.

Table XI. Summary of the New Stanford Achievement Test
Results and Differences Between Groups.

Test	Group	No.	Mean	Md.	S.D.	Sk.	Difference from Group	Critical Ratio (A)	Critical Ratio (B)
Reading	A-1 Arts	123	102	103	10.2	-.28	A-1 Sci	4.5	100
	A-1 Sci	121	98	99	11.4	-.26	C-1 Com	-	50
	C-1 Com	126	98	99	9.9	-.30	A-1 Arts	4.9	100
	C-2 Com	54	96	97	10.5	-.29	C-1 Com	1.6	86
Dictation	A-1 Arts	117	103	102	7.5	.40	A-1 Sci	2.6	96
	A-1 Sci	106	101	101	8.1	0.0	C-1 Com	6.1	100
	C-1 Com	124	105	106	6.9	-.43	A-1 Arts	3.7	99
	C-2 Com	52	105	104	7.6	.40	C-1 Com	0.6	66
Language Usage	A-1 Arts	116	101	102	10.2	-.29	A-1 Sci	6.6	100
	A-1 Sci	111	94	95	12.9	-.23	C-1 Com	2.3	94
	C-1 Com	124	92	93	11.5	-.26	A-1 Arts	9.9	100
	C-2 Com	53	94	94	11.1	0.0	C-1 Com	2.3	94
Literature	A-1 Arts	113	90	91	12.8	-.23	A-1 Sci	3.8	99
	A-1 Sci	106	86	88	15.0	-.40	C-1 Com	1.0	75
	C-1 Com	123	84	87	12.7	-.71	A-1 Arts	4.3	100
	C-2 Com	51	85	82	12.5	.72	C-1 Com	0.7	68
Arithmetic	A-1 Arts	116	105	105	9.5	0.0	A-1 Sci	7.3	100
	A-1 Sci	115	99	99	9.3	0.0	C-1 Com	7.4	100
	C-1 Com	94	105	106	7.2	-.41	A-1 Arts	0.5	63
	C-2 Com	53	106	104	7.4	.81	C-1 Com	1.0	75
Average	A-1 Arts	107	100	101	7.6	-.39	A-1 Sci	5.7	100
	A-1 Sci	93	96	98	9.1	-.65	C-1 Com	2.2	93
	C-1 Com	84	98	99	6.5	-.46	A-1 Arts	3.1	98
	C-2 Com	52	96	96	7.6	0.0	C-1 Com	2.6	96

(A) Ratio of the difference between the two means to its probable error.

(B) Number of chances in 100 of a true difference greater than zero being represented.

Table XII. Reading, Arithmetic, and General Achievement Scores, comparing students' completing and not completing Grade IX.

Group and Course		Tests Averaged (New Stanford)	No. of cases	Mean	Mdn.	S.D.	Sk.	Overlap
Arts	(a)	Reading	79	102	103	9.0	-.33	40.0
	(b)		40	100	100	11.4	.00	
Arts	(a)	Arithmetic	75	103	106	8.7	-.03	41.0
	(b)		34	103	103	8.7	.00	
Arts	(a)	All seven	73	101	100	7.2	.44	53.6
	(b)		28	101	101	7.2	.00	
Science	(a)	Reading	60	100	102	12.0	-.50	35.1
	(b)		57	97	96	10.2	.29	
Science	(a)	Arithmetic	54	103	104	8.4	-.36	14.0
	(b)		58	95	95	8.1	.00	
Science	(a)	All seven	49	100	100	8.4	.00	22.0
	(b)		41	94	95	8.1	-.40	
Commercial	(a)	All seven	14	98	100	8.4	-.71	38.0
	(b)		21	98	98	6.5	.00	

(a) Students who completed Grades VIII and IX in two consecutive years without changing schools or courses of study.

(b) Students who, for any reason, did not complete their two years in the normal period without changing schools or courses of study. All pupils are from Sample A-1 except Commercial course students (from C-2).

Table XIII. Reading, Arithmetic, and General Achievement Scores, comparing students completing and not completing Grade X.

Group and Course		Tests Averaged (New Stanford)	No. of cases	Mean	Mdn.	S.D.	Sk.	Overlap
Arts	(a)	Reading	40	104	103	9.0	.33	44
	(b)		79	100	101	10.2	-.29	
Arts	(a)	Arithmetic	39	106	108	8.7	-.68	30
	(b)		70	102	102	9.0	-.00	
Arts	(a)	All seven	37	102	103	7.8	-.38	34
	(b)		64	100	100	6.9	-.00	
Science	(a)	Reading	23	103	106	9.6	-.93	27
	(b)		93	97	98	10.8	-.27	
Science	(a)	Arithmetic	21	106	108	8.4	-.71	10
	(b)		91	98	97	8.7	.34	
Science	(a)	All seven	20	103	105	7.8	-.77	11
	(b)		69	96	97	8.1	-.37	

(a) Students who completed Grades VIII, IX, X, in three consecutive years without changing schools or courses of study.

(b) Students who, for any reason, did not complete their years in the normal period without changing schools or courses of study. All pupils are from Sample A-1.

Table XIV. French Test Ratings (American Council Beta)
Distribution of Scores.

Test	Grade	No.	Mean	S.D.	Q1	Q3	Sk.
Vocabulary	VIII	260	57.3	13.9	47.8	67.6	-.38
	IX	173	65.1	12.5	58.1	74.2	-.29
Comprehension	VIII	260	40.9	11.4	33.8	49.2	-.44
	IX	173	45.5	9.3	40.3	52.8	-.47
Grammar	VIII	260	11.7	7.7	5.4	16.4	.54
	IX	173	17.8	8.5	11.1	23.9	.39
Composite	VIII	260	109.0	29.2	86.3	131.0	-.15
	IX	173	128.7	29.2	110.9	149.4	-.39

Table XV. French Test Ratings (American Council Beta)
of pupils who dropped their school courses
as compared with those continuing.

Group and Course	Grade	No.	Mean	Mdn.	S.D.	Overlap
Arts {a)	IX	98	124	127	31.6	22
{b)	IX	67	106	105	28.9	
Science {a)	IX	68	118	121	26.8	26
{b)	IX	76	106	103	30.3	
Arts {a)	X	42	151	147	22.4	31
{b)	X	50	135	136	27.9	
Science {a)	IX	82	144	147	25.9	32
{b)	X	24	131	137	29.8	
{a)	X	68	121	126	27.9	34
{b)	IX	62	127	131	27.7	
	IX	30	117	114	29.0	

(a) Students who completed the grade specified (either IX or X) two years after taking the examination.

(b) Students who, for any reason, did not complete their two years in the normal period without changing schools or courses of study. First four groups are from sample A-2 examined in Grade VIII, other seven from sample A-1, examined in Grade IX.

APPENDIX

Table XVI. Distribution of Grade VII Marks of Secondary School Pupils.

Boys

Group	Course (High School)	No.	Mean	S.D.	Sk.
A-1	Arts	109	80.3	6.4	-0.09
	Science	112	77.1	5.8	0.72
A-2	Arts	136	78.8	7.0	0.73
	Science	133	74.4	5.9	0.76
B-1	Matriculation	77	83.2	5.3	-
B-2	Matriculation	90	79.1	6.1	-0.34
B-3	Commercial	29	79.4	6.1	0.34
B-4	Commercial	26	76.4	5.3	0.51
C-1	Commercial	77	78.2	5.5	0.60
C-2	Commercial	191	76.2	6.0	0.77

Girls

Group	Course (High School)	No.	Mean	S.D.	Sk.
B-2	Matriculation	45	82.1	6.0	0.27
		99	80.1	6.0	0.05
B-4	Commercial	107	78.6	6.5	0.87
		94	75.8	6.8	-0.31
C-2	Commercial				

Table XVII. Coefficients of Correlation Between School Marks in Grade VII and Subsequent Years.

Group	VII-VIII	VII-IX	VII-X
A-1 Arts	.63 ± .04	.73 ± .04	.44 ± .09
A-2 Arts	.85 ± .02	.82 ± .02	-
A-1 Science	.69 ± .04	.62 ± .06	.57 ± .10
A-2 Science	.60 ± .04	.54 ± .06	-
B-1 Matriculation	.72 ± .03	.54 ± .06	.61 ± .07
B-2 Matriculation	.74 ± .03	.65 ± .05	-
C-1 Commercial	.64 ± .04	-	-
C-2 Commercial	.70 ± .06	.62 ± .07	-

Table XVIII. Comparison of Grade VII Marks, for Pupils in Two Consecutive Classes of School A Who Completed Two and Three Years of Secondary School in Their Original Course.

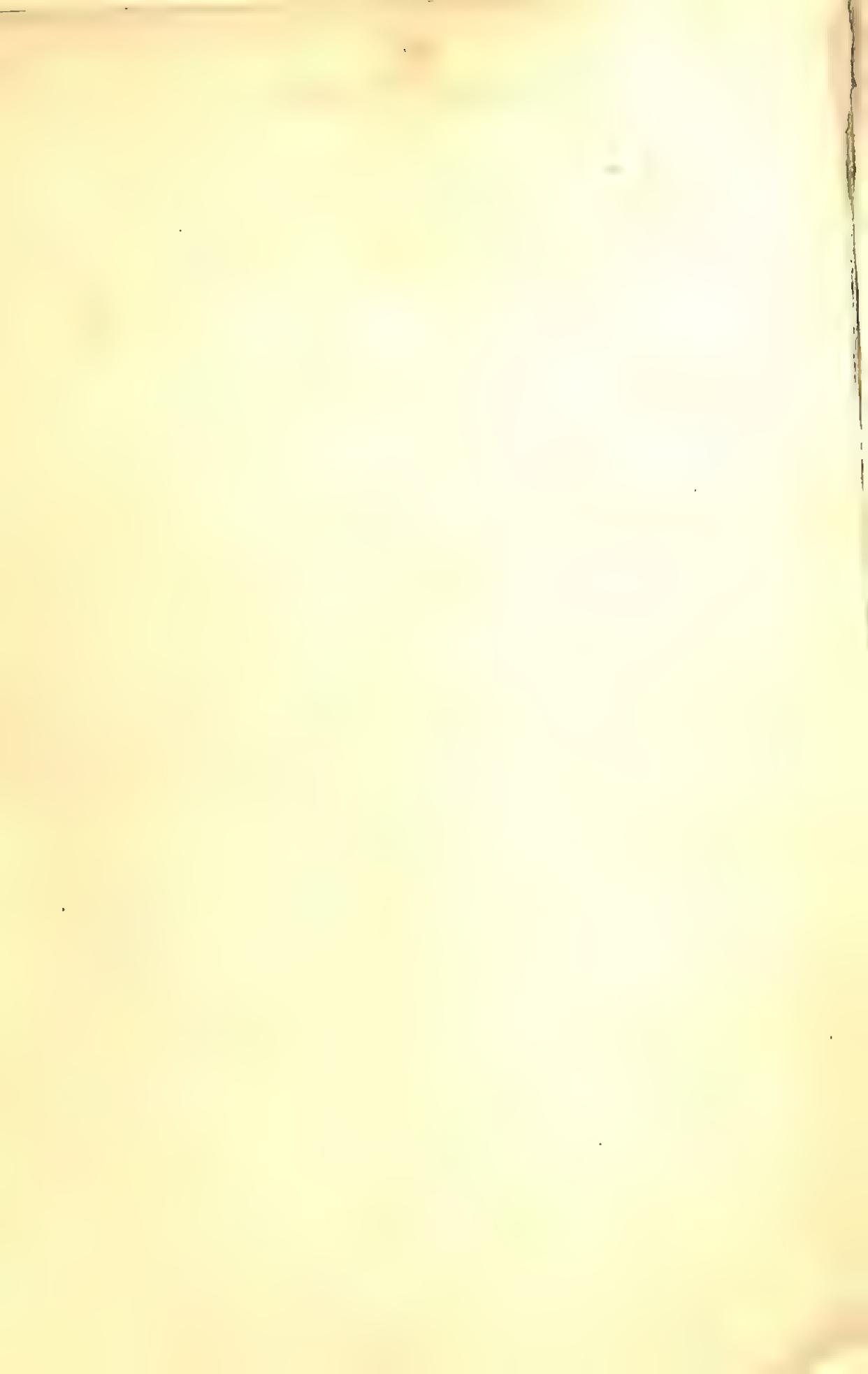
Group	Course	(a) or (b)	No.	Mean	Md.	S.D.	Overlap
A-1 Grade X	Arts	{(a) (b)}	37 66	83.5 78.0	83.0 77.7	6.3 5.4	17
	Science	{(a) (b)}	21 88	80.9 76.0	80.0 75.2	6.0 5.4	
A-1 Grade IX	Arts	{(a) (b)}	71 32	80.8 78.0	81.1 77.8	6.6 4.8	23
	Science	{(a) (b)}	54 58	79.6 74.2	78.0 73.9	5.7 4.5	
A-2 Grade IX	Arts	{(a) (b)}	81 56	81.4 72.4	80.9 72.1	6.1 5.6	5
	Science	{(a) (b)}	61 68	77.0 71.6	75.4 70.7	5.2 4.6	

(a) Students who completed the grade stated in the minimum number of years.

(b) Students who, for any reason, did not complete the grade stated without changing schools or course of study.

Table XIX. Correlations between School Marks for Specific Subjects
Grades VIII, IX and X.

Subject	School	Correlation Marks of Grades		Subject	School	Correlation Marks of Grades	
		VIII-IX	IX-X			VIII-IX	IX-X
Spelling	A	.54 ± .04	-	Geometry Elementary	A	-	.39 ± .07
	B	.32 ± .08	-		B	-	.67 ± .06
Grammar (English)	A	.64 ± .03	-	Geometry, Elemt. and Advanced	A	-	.62 ± .07
	B	.52 ± .07	-		B	-	.35 ± .13
Composition	A	.35 ± .05	.22 ± .07	Latin	A	.61 ± .05	-
	B	.63 ± .06	.43 ± .09		B	.65 ± .05	-
Literature	A	.66 ± .03	.47 ± .06	Latin Grammar	A	-	.63 ± .06
	B	.56 ± .06	.61 ± .07		B	-	.78 ± .06
Drawing	A	.61 ± .03	.24 ± .11	Latin Composition	A	-	.74 ± .05
	B	.57 ± .06	.79 ± .04		B	-	.60 ± .10
Geography	A	.55 ± .04	-	Science	A	.65 ± .05	-
	B	.64 ± .05	-		B	-	-
History	A	.55 ± .04	.51 ± .06	Science and Physics	A	-	.70 ± .07
	B	.66 ± .05	.54 ± .08		B	-	.68 ± .08
French	A	.75 ± .03	.73 ± .04	Science and Chemistry	A	-	.74 ± .06
	B	.85 ± .03	.72 ± .05		B	-	.52 ± .10
Arithmetic	A	.50 ± .04	-	Average Latin Class	A	-	.65 ± .06
	B	.47 ± .07	-		B	-	.78 ± .07
Algebra, Elemt.	A	.59 ± .04	.26 ± .07	Average Science Class	A	-	.85 ± .03
	B	.59 ± .07	.53 ± .08		B	-	.87 ± .04
Algebra, Elemt. and Advanced	A	-	.61 ± .07	Average All Classes	A	.80 ± .02	-
	B	-	.45 ± .11		B	.85 ± .03	-



Selected Bibliography

The following bibliography is designed to direct further reading in reference to various aspects of vocational and educational guidance. Each book selected can be read with profit by the layman lacking a technical training in psychology.

Psychological Tests.

Aptitudes and Aptitude Testing. Walter Van Dyke Bingham. Harper and Brothers, New York. 1937.

Educational Guidance.

Psychology and the New Education. Pressey, S. L. Harper and Brothers, New York. 1933.

Educational Psychology. Edited by C. E. Skinner. Prentice Hall, New York, 1937.

Vocational Guidance.

Vocational Guidance Throughout the World. Keller, F. J. and Vitelles, M.S. W. W. Norton and Co. New York, 1937.

Handbook of Vocational Guidance. Oakley, C. A. and Macrae, A., University of London Press, London, 1937.

Vocational Information.

Choosing your Life Work. Alberta Teachers Association, Edmonton, 1938.

Publications of the National Occupational Conference, 551 Fifth Avenue, New York.

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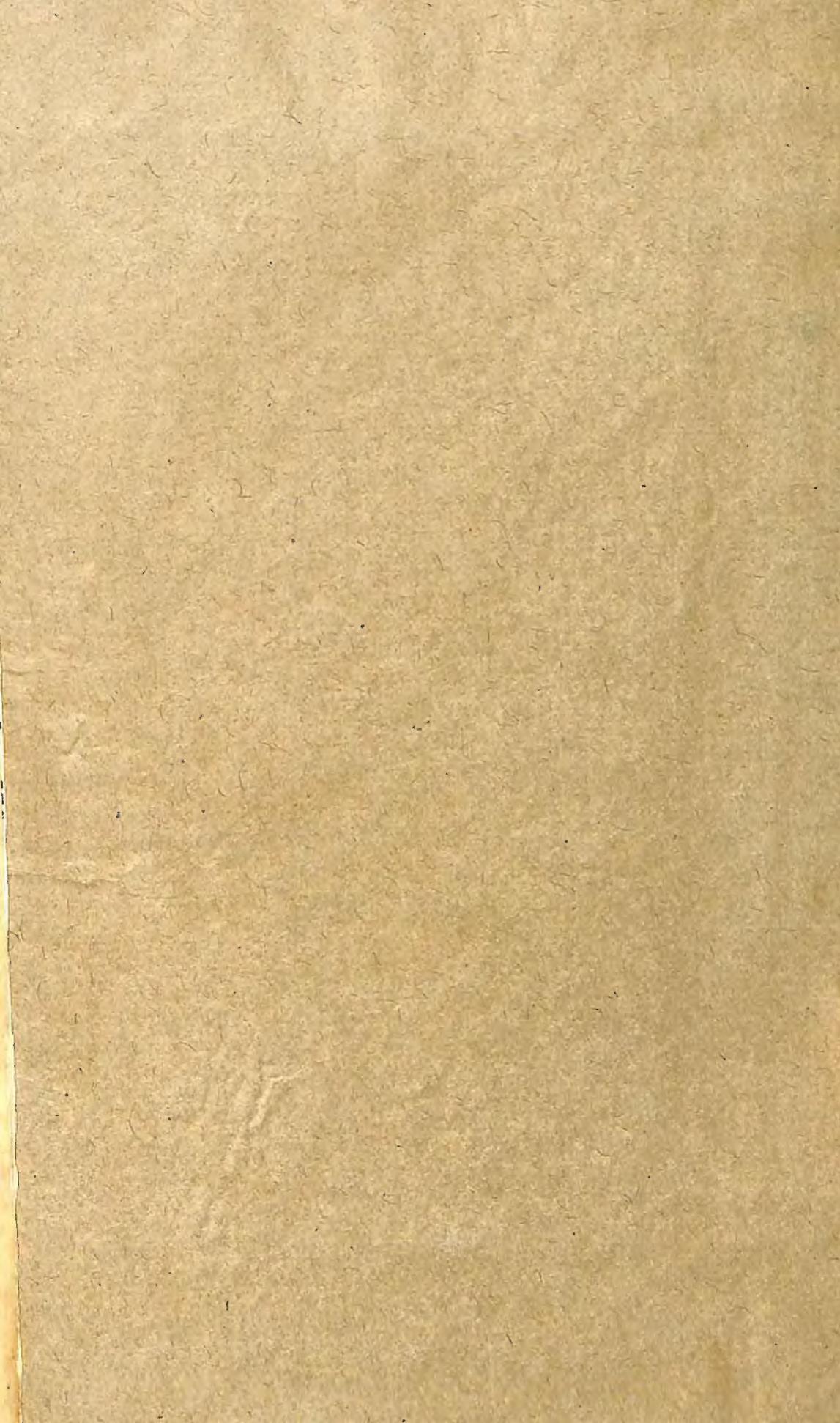
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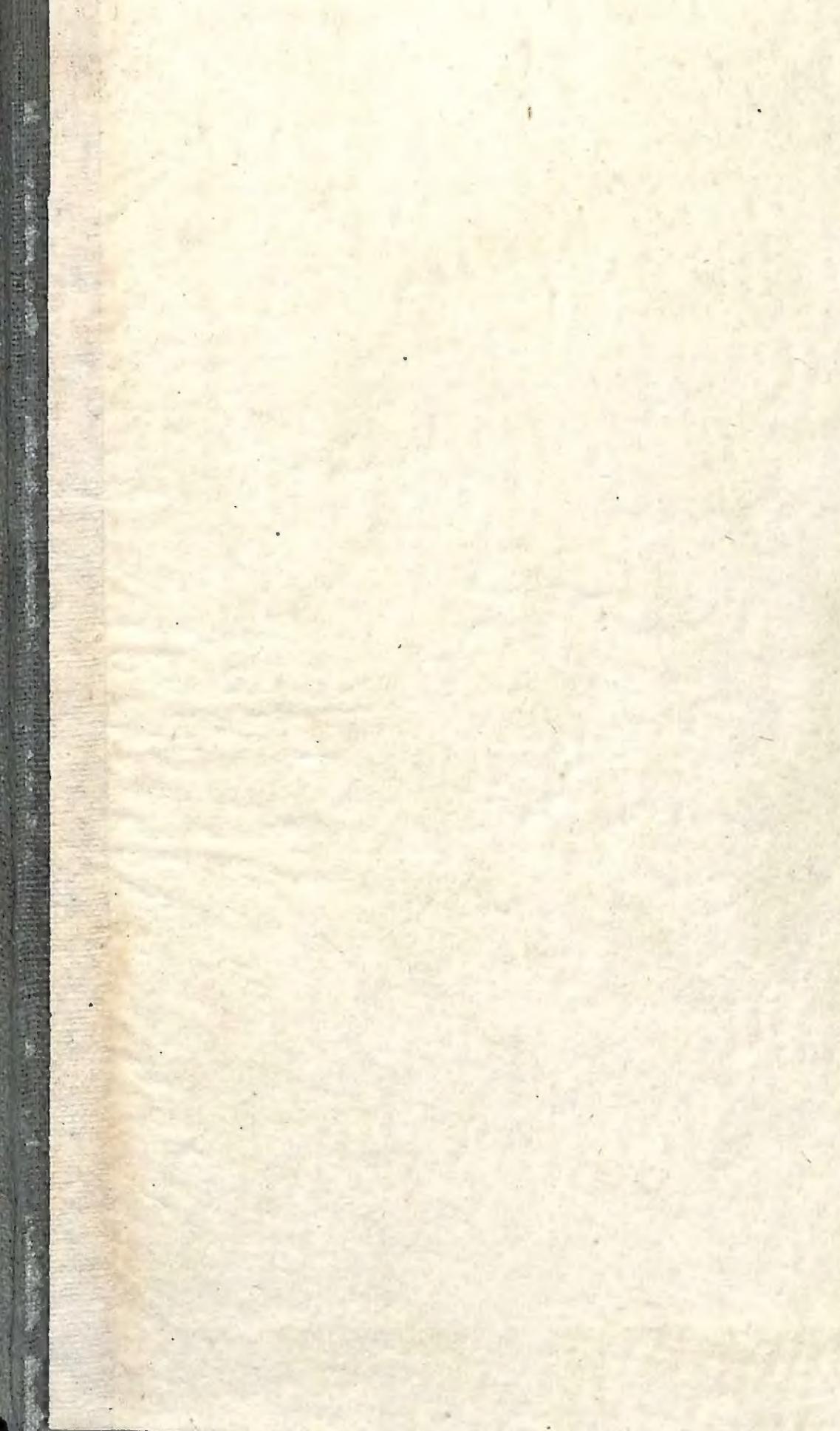
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